fers from the motion of the radioactive atoms only in that it does not take part in the diffusive motion. This fact is often overlooked and the displacement of the radioactive atoms is reckoned from the cold ends of the specimens. The author shows that, in the general case, such experiments do not permit determining the direction, nor the magnitude of absolute ion mobility. Reference to cold ends can yield satisfactory results only if the concentration of the investigated component is small, and its mobility large in comparison with the mobility of the other components of the alloy. In conclusion, the displacement of the radioactive zone should be referred to a system of coordinates which does not take part in the diffusion and which is found in the same (homogeneous) temperature region of the specimen, as the radioactive zone. There is 1 figure and 15 references: 13 Soviet-bloc and 2 non-Soviet-bloc.

ASSOCIATION: Kyyivs'kyy derzhavnyy universytet im. T.H. Shevchenka (Kyyiv State University im. T.H. Shevchenko)

SUBMITTED: May 4, 1961

Card 3/3

S/161/62/004/002/031/051
B101/B102

AUTHORS: Kashchenko, M. P., Ostrovskiy, L. F., and Koval'chuk, V. S

TITLE: Mobility of Sb, Fe, and Co in solid copper

PERIODICAL: Fizika tverdogo tela, v. 4, no. 2, 1962, 408 - 415

TEXT: A 0.5 - 1.0 μ thick film of Sb^{124}, Co^{60}, or Fe^{59} was electrodeposited onto the end faces of cylindrical copper specimens of 3 - 3.5 mm diameter and 15 - 20 mm length. The specimens were connected to the electrodes of a vacuum device and subjected to current densities of 150 - 250 a/cm^2 at elevated temperatures. Subsequently, layers were mechanically separated parallel to the contact areas, and the activity was measured in a β-ray device with a gamma counter. The integral activity N was plotted versus the depth x of the layer under examination, wherefrom the velocity of ion motion and the diffusion coefficient D were calculated. The absorption of radiation by the substance was taken into account when calculating v and D for Sb in Cu: $i(x) = \mu N + \partial N/\partial x$, where i(x) is the true specific activity at the depth x, and μ is the experimentally determined linear absorption coefficient. $\partial N/\partial x$ was found by graphica'

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Mobility of Sb, Fe, and Co...

differentiation. The relation $D_{Sb} = 1/4t \tan\varphi$ was derived from $\ln = f(x^2)$, φ denotes the slope of the straight line. v and D were used to calculate $F/eE = vkT\alpha/Dei\varrho$, where F is the force determining the ion mobility in the lattice; eE is the effect of the electric field E on a singly charged ion; i is the current density; ϱ is the resistivity; $\alpha = 0.78$. The scattering cross section σ^* for the activated ion was calculated from $-F/eE = q - \bar{q}\sigma^*/\bar{\sigma}$, where q is the charge of the diffusion ion, $\bar{q}$ is the average charge of a lattice ion; $\bar{\sigma} = e^2\varrho\bar{q}/(2m\zeta)^2$, where $\bar{\sigma}$ is the average scattering cross section, m is the electron mass, and ζ is the Fermi energy (for Cu ζ = 7 ev). In addition, the effective charge q^* of the activated ion was calculated from $\sigma^* = (\pi q^{*2} e^4/2\zeta^2)[\ln(1+1/y) - 1/(1+y)]$. Results: (1) All the three metals move toward the anode; (2) the ions in the lattice migrate due to an electron wind which is 30 times stronger than the field effect on a singly charged ion; (3) $\sigma^*_{Co} = 4.8 \cdot 10^{-16}$ cm^2 (average value for 1155 - 1218°K); $q^*_{Co} = 1.20$ electrostatic units; $\sigma^*_{Fe} = 6.7 \cdot 10^{-16}$ cm^2 (1307 - 1323°K); $q^*_{Fe} = 1.4$; $\sigma^*_{Sb} = 5.6 \cdot 10^{-16}$ cm^2 (1093 - 1143°K); $q^*_{Sb} = 1.35$. According to previous papers (Ukr. fiz.

zhurn. 5, 720, 1960; ibid., 6, 116, 1961), q has the following values for non-activated ions: $q_{Co} = 2.8$; $q_{Fe} = 3.12$; $q_{Sb} = 2.6$. The smaller charge of the activated ions is possibly due to varying electron structures. There are 2 figures, 1 table, and 14 references: 13 Soviet and 1 non-Soviet. The reference to the English-language publication reads as follows: K. Compaan, Y. Haven, Trans. Faraday Soc., 52, 786, 1956.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko (Kiyev State University imeni T. G. Shevchenko)

SUBMITTED: September 25, 1961

5.4700

S/181/62/004/005/042/055
B139/B102

AUTHORS: Kuz'menko, P. P., and Ostrovskiy, L. F.

TITLE: Mobility of silver in nickel

PERIODICAL: Fizika tverdogo tela, v. 4, no. 5, 1962, 1358-1360

TEXT: The polished front faces of round nickel rods, 5 mm in diameter and 15 - 20 mm in length, were coated with a layer of radioactive silver 0.5 - 1.0μ thick. The specimens were electrically connected in vacuo, the areas of contact being preheated to 900°C and then brought up to the temperature required for the experiment. Current density was 40 - 120 a/mm^2. Subsequently, the depth distribution of integral activity $N_{(a)}$ was measured in the anode and cathode parts of the layers removed by mechanical means. Owing to a notable evaporation of silver, this amounted to only 300 - 700 imp./min, with a background of 40 imp./min. As an example experiment no. 5 gave the following results: t= 3 hrs, T = 1643°K, current density i = 74 a/mm^2, ion velocity v = 16.3×10^{-7}cm/sec, diffusion coefficient D = 15.6×10^{-9} cm^2/sec, electric resistance of nickel

Card 1/2

at the experimental temperature $\rho = 60.7 \times 10^{-6}$ ohm.cm, $\frac{F}{eE} = 26$. These results cannot be explained by field action on the positive charge of the silver ion, but rather on the assumption that the electronic holes play the same part as the electrons in simple metals. In the case of transition metals through which d-c flows, the force of the hole wind is decisive for migration. In interpreting experimental results, this fact must be taken into account when migration proceeds toward the cathode. There are 1 table and 1 figure.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko (Kiyev State University imeni T. G. Shevchenko)

SUBMITTED: December 30, 1961

40883

S/181/62/004/009/016/045
B108/B186

AUTHOR: Kuz'menko, P. P.

TITLE: Scattering cross section and effective ion charge in metals

PERIODICAL: Fizika tverdogo tela, v. 4, no. 9, 1962, 2434 - 2440

TEXT: The scattering cross sections and the effective charges of impurity ions in Cu, Ag, Au, Al and Pb were studied. The residual resistivity of metals is changed by impurities which disturb the crystal lattice through a geometrical factor. The scattering cross section can be calculated from this residual resistivity ($\Delta\rho_0$ for 1 at% impurity) by using the following formula given by Mott (The Theory of the Properties of Metals a. Alloys, Oxford, 1936): $\sigma = \Delta\rho_0 e^2 n \cdot 100/(2m\xi)^{1/2}$, where n is the number of conduction electrons per metal atom and ξ is the Fermi energy. The effective charge can be determined from the scattering cross section by using the formula $\sigma = \frac{\pi}{2}\frac{q^2e^4}{\xi^2}\left[\ln(1+1/y) - 1/(1+y)\right]$. $q = q_i - q_0$ is the difference

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Scattering cross section and...

in the effective charges of dissolved substance (impurity) and solvent (metal); $1/y = 5.14 \cdot 10^{-8} (n_0)^{1/3}$; n_0 is the number of conduction electrons per unit volume of the metal. By considering the effective charge to be the charge of an impurity atom for one conduction electron it is possible to estimate the effective charge, using the idea that the conduction electrons are screened from the positive charge by the valence electrons. It is established that only one valence electron of multivalent impurities contributes to conduction. The rest of the electrons are in a bound state. In the case of high impurity concentration (solid solution), $\Delta\varrho$ depends parabolically on the concentrations. By considering this aspect one obtains $\sigma = ne^2Mk\Theta^2\varrho/2(2m\xi)^{3/2}T$ (11) for σ of the defects, where Θ is the characteristic temperature. q, q_i and σ were calculated numerically for Cu, Ag, Au, Al and Pb. $\Delta\varrho_0$-values for Al were taken from F. Pawlek and K. Reichel (Metal, 12, 1, 1958), while for Pb own measurement data were used. There are 5 tables. The most important English-language reference is: R. O. Simmons, R. W. Baffuli, Phys. Rev., 117, 62, 1960.

Card 2/3

Scattering cross section and... S/181/62/004/009/016/045
B108/B186

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko
(Kiyev State University imeni T. G. Shevchenko)

SUBMITTED: April 16, 1962

Card 3/3

S/181/62/004/010/003/063
B108/B186

AUTHORS: Kuz'menko, P. P., Novikov, N. N., and Gorid'ko, N. Ya.

TITLE: The photomechanical effect in antimony

PERIODICAL: Fizika tverdogo tela, v. 4, no. 10, 1962, 2656-2659

TEXT: Earlier studies (G. C. Kuczynski, R. H. Hochman. J. Appl. Phys., 30, 267, 1959) revealed a photomechanical effect (reduction in microhardness) in germanium in the range of intrinsic absorption (2 - 4μ). Attempts were made to find out whether this effect occurs in other materials with similar intrinsic absorption bands, e. g. in Sb or Bi. To study this effect in antimony, small specimens of high purity (99.999%) were hardness-tested at an approximately constant temperature of 15-16°C using a ПМТ-3 (PMT-3) device with a diamond pyramid. The microhardness was found to decrease linearly with the intensity of light in the visible and near infrared region used for illuminating the sample. This decrease, however, continues only to about 30,000 lux, and the microhardness which up to there has dropped by 45% remains constant at higher illuminances. Tests with filtered light showed that the

The photomechanical effect in antimony

photomechanical effect is due only to infrared radiation, which proves some semiconducting property of antimony. The infrared light transfers electrons to higher energy levels thus changing the dislocation mobility and, consequently, also the mechanical properties of antimony. Careful examination of Cu revealed no photomechanical effect. There are 4 figures.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko (Kiyev State University imeni T. G. Shevchenko)

SUBMITTED: April 23, 1962 (initially)
June 12, 1962 (after revision)

Card 2/2

S/181/62/004/010/059/063
B102/B104

AUTHORS: Kuz'menko, P. P., and Ostrovskiy, L. F.

TITLE: The Ag^{110} mobility in magnesium

PERIODICAL: Fizika tverdogo tela, v. 4, no. 10, 1962, 2984-2986

TEXT: The Ag^{110} mobility in Mg of the variety MG-1 (MG-1) was determined by a d-c method described in the authors' earlier papers (UFZh, 6, 525, 1961; FTT, 4, 490, 1962; 4, 1360, 1962). The measurements were made in the range 470-570°C at current densities of 38 - 63 a/mm^2. The curves showing the depth-dependence of the integral activity enabled the migration rate v was calculated. Then, by comparing the forces acting on the ion ($F/Ee = v\alpha kT/Dei\varrho$) in accordance with the usual procedure, the effective charge of the silver ion and the mean scattering cross section are calculated, using Fiks' theory (V. B. Fiks, FTT, 1, 16, 1959):

$-F/eE = q^* - \bar{q}\,\sigma/\bar{\sigma}$, where q^* is the charge of the activated ion, $\bar{q}$ is the mean ion charge in the metal, σ the scattering cross section of the

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The Ag^{110} mobility in magnesium

S/181/62/004/010/059/063
B102/B104

activated Ag ion and $\bar{\sigma}$ the mean scattering cross section. The results were: $\bar{\sigma} = 6.7 \cdot 10^{-16} cm^2$ which is almost equal to the cross section r^2_{κ}, and $\bar{q}_{Ag} = 1.5$. The great value of $\bar{q}$ shows that the Ag electron structure in Mg differs greatly from that of activated Ag in Ag. There are 1 figure and 1 table.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko (Kiyev State University imeni T. G. Shevchenko)

SUBMITTED: June 14, 1962

Card 2/2

43129
S/181/62/004/011/030/049
B125/B186

24.7500

AUTHORS: Kuz'menko, P. P., and Grinevich, G. P.

TITLE: Diffusion and mobility of Sb^{124} in nickel

PERIODICAL: Fizika tverdogo tela, v. 4, no. 11, 1962, 3266-3269

TEXT: It is shown that the temperature dependence of the diffusion coefficient satisfies the following relation: $D_{Sb} = 1.8 \cdot 10^{-5} \exp[-27000/RT]$. When d-c passes through the specimens a migration of Sb to the cathode was observed in all the experiments. It is concluded from a thorough analysis of the $D_{Sb}(T)$ curve that the migration is due to a hole wind, resulting from scattering of holes from Sb ions. Specimens were prepared from a 99.97% Ni base on which a radioactive Sb film, 1-2 μ thick, was electrolytically deposited. Specimens were preliminarily annealed for 30-40 min at 600°C to initiate diffusion and ensure resorption of Sb. Test temperatures ranged between 1020 and 1220°C. The activation energy of self-diffusion of Ni was found to exceed that of the antimony diffusion by a factor of 2.5. In order to study the mobility of Sb^{124} in Ni, radioactive

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Sb was deposited in the same way on the carefully ground faces of two Ni cylinders of 3-5 mm diameter and 15-20 mm long. After contact had been established between the activated surfaces of the two cylinders they were connected to the electrodes of an evacuated apparatus. The current density inside the sample reached 100 a/mm^2. The contact area was heated first to 580-600°C and then held at these temperatures for 25-30 min. Then the temperature was raised to test levels and the holding time was varied between 7 and 22 hrs. Afterwards the test specimens were separated at the contact surface and the γ-activity distribution along the sample axis was measured on both sides. From the curves showing the dependence of the integral activity on the depth of penetration the expression $F/eE - VkT\alpha/Dei\varrho$ was calculated; the mobility of the Sb ion can be calculated from the force F, eE is the force acting on a single ion, i is the current density, ϱ is the specific electric resistance, $\alpha = 0.78$. According to the experimental data, F/eE tends to increase with decreasing T, which contradicts the theory. Consequently it is not possible to explain the direction of the Sb migration by the direction of the field strength. Therefore, it may be assumed that Sb is transported by the force of the hole wind. Similar results were obtained by one of the authors

(FTT, 4, 5, 1358, 1962) for the migration of Ag in Ni. There are 3 figures and 2 tables.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko (Kiyev State University imeni T. G. Shevchenko)

SUBMITTED: June 28, 1962

Table 2. Mobility of antimony in the direction of motion.

Legend: (1) number of experiment; (2) t, hours; (3) cm^2/sec; (4) v, μ/hr; (5) $\rho \cdot 10^5$, ohm·cm; (6) direction of transfer.

Card 3/4

S/185/62/007/002/001/016
D299/D302

24.7700 (1043, 1055, 1144)

AUTHOR: Kuz'menko, P.P.

TITLE: Mobility mechanism and effective ionic charges in metals (Survey)

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 7, no. 2, 1962, 117 - 130

TEXT: Experimental methods are reviewed, used in the study of ionic mobility in metals. The nature of ionic mobility is discussed. The following experimental methods are considered: Diffusion in the presence of an electric field, the method of radioactive tracers, the method of weighing, and the combined method (radioactive tracers plus weighing). With regard to the diffusion method, the diffusion coefficient in the direction of the field equals that in the opposite direction and also the diffusion coefficient in the absence of the field; the experimental results are in agreement with the theory. The tracer method has the advantage that it yields not only the transport rate v, but also the diffusion coefficient D; this is

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important for quantitative studies of the magnitude of the resultant force, responsible for the transport. The tracer method was successfully used with Ag, Al, Cu, Au, Sb, Cd, Zn, Pb, and the alloys Al-Zn, Al-Ag, Fe-Al, Ag-Mg, and Mg-Cd; it could not be used with Fe, Ni, Ti. The combined method was used for studying the mobility of Fe and Al in Fe-Al alloys. The nature of ionic mobility: For all the metals, the transport took place towards the anode. This shows that the mechanism of ionic mobility in metals differs substantially from that in electrolytes. The transport of ions to the anode, in the presence of a d.c.-field in the metal, can be explained by the fact that the activated ion is not only subjected to the field forces, but also to the stronger force of the electronic wind. The latter arises as a result of the scattering of valence electrons. Further, the transport rate v was studied in relation to various factors. The experimental results concerning ionic mobility, were in agreement with Fick's theory. The following problems still remain open: Whether the transport in the investigated metals is due to the force of the electronic wind only, or to the sum of the field and electronic wind forces; the role of the hole wind.

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Mobility mechanism and effective ... S/185/62/007/002/001/01[illegible]
D299/D302

Using Fick's equation and experimental values of F/eE, it is possible to determine the scattering cross-section σ* of activated ions; σ* was found to be temperature independent. For determining the effective charge q* of the activated ion, the author uses a formula analogous to Mott's formula for the scattering cross-section. The use of Mott's cross-section for activated ions is substantiated by the agreement between the experimental and calculated values of σ*. The obtained charges are in fact the effective charges of activated ions, on which conduction-electrons are scattered. There are 10 figures, 2 tables and 27 references: 20 Soviet-bloc and 7 non-Soviet-bloc, (including 2 translations). The references to the English-language publications read as follows: E. Compaan, L. Harren, Trans. Far. Soc., 52, 786, 1956; N. Mott, H. Jones, Theory of the Properties of Met. and Alloys, Oxford, 1936.

ASSOCIATION: Kyyivs'kyy derzhuniversytet im. T.H. Shevchenka (Kyyiv State University im. T.H. Shevchenko)

SUBMITTED: June 14, 1961

Card 3/3

S/185/62/007/011/014/019
D234/D308

AUTHORS: Kuz'menko, P.P. and Suprunenko, P.O.

TITLE: Some anomalous properties of α-Ti

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 7, no. 11, 1962, 1242-1245

TEXT: Metals in which the last Brillouin zone is almost completely filled exhibit as a rule absorption bands in the red and infrared regions. The band width is assumed to correspond to an energy ΔE. If such metals are heated, a part of the electrons will probably pass into the almost empty higher energy where their mobility will be greater. This will cause an increase in the conductivity and the temperature dependence of the resistance will therefore differ from that of other metals. In the case of α-Ti $\sigma = \sigma_1 + \sigma_2$, σ_1 being the conductivity when the passage of electrons can be neglected. The resistance $\sigma_1 = 1/\rho_1$ can be found by extrapolation to high temperatures. Assuming that the conductivity can be described as for a semiconductor, except that the mobility of an

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electron is proportional to 1/T and the Fermi energy is practically independent of temperature, $\ln(\Delta\rho/\rho) - (3/2) \ln T$ must depend linearly on 1/T. This is confirmed graphically, and the value of ΔE was found to be 2.8 kcal/mole. The deviation of the heat capacity from 5.95, found by a similar method, is 2.4 kcal/mole, which agrees well with experimental data. According to the above, an infrared absorption band near 11 microns is to be expected. There are 4 figures.

ASSOCIATION: Kyyiv'skyy derzhuniversytet im. T.H. Shevchenka
(Kiev State University im. T.H. Shevchenko)

SUBMITTED: April 20, 1962

Card 2/2

S/185/62/007/012/012/021
D234/D308

AUTHORS: Kuz'menko, P.P. and Kal'na, H.I.

TITLE: X ray structural investigations of ordered Mg-Cd systems

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 7, no. 12, 1962, 1335 - 1338

TEXT: Polycrystalline specimens with the Cd content ranging from 10 to 80 at.% as well as specimens of pure Cd and Mg were investigated. At 300°C there is a single-phase solid solution and all alloys possess a close-packed hexagonal structure. There is no smooth variation of lattice parameters with concentration. With decreasing temperature all alloys showed an order-disorder transition, with an ordered structure on the basis of $MgCd_3$ or MgCd, depending on Cd content. At 20°C alloys with 75.3%Cd or more have an unordered phase with parameters near to those of pure Cd and an ordered one. Anomalies are observed in the temperature dependence of

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X ray structural investigations ...

lattice parameters and heat capacity. At 20 - 300°C, a and c are proportional. At 300 - 355°C a varies much more than c, and at 355 - 405°C c increases anomalously while a remains practically constant. There are 4 figures.

ASSOCIATION: Kyyivs'kyy derzhuniversytet im. T.H. Shevchenka (Kiev State University, im. T.H. Shevchenko)

SUBMITTED: May 21, 1962

Card 2/2

S/185/62/007/012/013/021
D234/D308

AUTHORS: Kuz'menko, P.P. and Kal'na, H.I.

TITLE: Long-distance order parameters and distribution of atoms over the lattice points in Mg-Cd alloys

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 7, no. 12, 1962, 1340 - 1344

TEXT: The authors calculated the long-range order parameter for Cd content ranging from 10 to 75.3 at.%, using the formula $(J_s/J_f)\ k^2F^2_f\ /(f_1-f_2)^2\varepsilon^2$, where f_1 and f_2 are atomic factors of the components, J_s and J_f are intensities of a superstructural and a fundamental line and F_f is the structural amplitude of the fundamental line. On comparing the calculated results with experimentally determined parameters, disagreement was observed in the cases of 10, 16.6 and 66.7 % Cd. The calculated values indicate that the order-disorder transition is of the type of a phase transition of the first

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kind. The distribution of atoms over the lattice points, determined from the structural factors of two fundamental lines (202), (220) and two superstructural lines (112), (102), are plotted against Cd concentration. There are 4 figures and 1 table.

ASSOCIATION: Kyyivs'kyy derzhuniversytet im. T.H. Shevchenka (Kiev State University, im. T.H. Shevchenko)

SUBMITTED: June 7, 1962

S/185/62/007/012/015/021
D234/D308

AUTHORS: Kuz'menko, P.P. and Koval'chuk, V.S.

TITLE: The electric transfer of Sb in Al

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 7, no. 12, 1962, 1350 - 1354

TEXT: The authors studied the transfer of Sb^{124} in cylindrical specimens of 99.9 % pure Al in the presence of constant current (thin layers of Sb were formed electrolytically on both ends of a specimen for this purpose). Sb was transferred towards the anode in all cases. The results are tabulated together with the transfer velocity, boundary diffusion coefficient and effective charge determined for each case. The effective charge was much smaller than the valency of Sb, which leads to the conclusion that Sb atoms move along the grain boundaries in neutral state. There are 3 figures and 1 table.

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The electric transfer of Sb in Al

S/185/62/007/012/015/021
D234/D308

ASSOCIATION: Kyyivs'kyy derzhuniversytet im. T.H. Shevchenka (Kiev State University im. T.H. Shevchenko)

SUBMITTED: May 4, 1962

Card 2/2

S/148/62/000/011/007/013
E111/E435

AUTHORS: Kuz'menko, P.P., Ostrovskiy, L.F.

TITLE: Electro-transfer of silver in copper

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Chernaya metallurgiya, no.11, 1962, 146-149

TEXT: The transfer of silver in solid copper under the influence of heavy direct currents was studied with the aid of the radioactive isotope Ag^{110}. With intensive cooling of the electrode current densities of 200 to 300 A/mm^2 could be obtained. After current had passed for several hours the distribution of radioactivity along the specimen on one end of which a layer of Ag^{110} had previously been deposited was studied. Substantial transfer of silver towards the anode occurred indicating that, as in other systems studied by the authors, the motive force was the force of the electron wind. From the results obtained the average value of the effective charge of the activated (i.e. participating in the diffusion) silver ion in copper was found to be 0.73 electron units. There are 1 figure and 1 table.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet (Kiyev State University)

SUBMITTED: February 21, 1961

Card 1/1

S/126/62/013/003/011/023
E021/E180

AUTHORS: Kuz'menko, P.P., Ostrovskiy, L.F., and Koval'chuk, V.S.

TITLE: Mobility of small tin additions in copper and silver

PERIODICAL: Fizika metallov i metallovedeniye, v.13, no.3, 1962, 406-410

TEXT: The absolute transfer of tin in copper and silver during the passage of a direct current was studied by a method described previously (Ref.2: P.P. Kuz'menko, L.F. Ostrovskiy, Ukr.fiz.zhurnal, no.6, 1961, 525). A thin layer of radioactive tin was deposited electrolytically on one end of two similar samples (2.5-3.5 mm diameter and 15-20 mm length). The active surfaces were placed in contact and connected to the electrodes in a vacuum apparatus. Current densities varied from 140 to 400 A/mm^2. The contact region was heated by direct current to 220 °C and held for 15-20 minutes. Then the current was increased and the contact region heated to the test temperature. After the test, the sample was removed from the apparatus and

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broken along the contact plane, and the distribution of activity in the cathode and anode halves was measured. In all the experiments the tin migrated to the anode. Therefore, the force causing the migration is due to electrons, and arises from the scattering of valency electrons of the activated tin ions, because of the destruction of the periodicity of the lattice potential by the tin ions. The effective charge of the activated tin ion in electron units was calculated from the results obtained at different temperatures. For tin in pure copper, the effective charges at 1075, 1109, 1174 and 1155 °C are 1.6, 1.8, 1.3 and 1.0. For tin in copper + 0.1 atomic % tin the charges at 1101, 1161, 1159 °C are 1.5, 1.3 and 1.1. For tin in silver + one atomic % tin the charges at 1205, 1115, 1076, 1181, 1073 and 997 °C are 1.1, 1.2, 1.3, 0.9, 1.3 and 1.5 respectively.
There are 4 figures and 2 tables.

ASSOCIATION: Kiyevskiy gosuniversitet im. T.G. Shevchenko
(Kiev State University imeni T.G. Shevchenko)

SUBMITTED: June 21, 1961

KUZ'MENKO, P.P.; NOVIKOV, N.N. [Novykov, M.M.]; GORID'KO, N.Ya. [Horyd'ko, M.IA.]

Photomechanical effect in titanium. Ukr. fiz. zhur. 8 no.1: 116-120 Ja '63. (MIRA 16:5)

1. Kiyevskiy gosudarstvennyy universitet im. Shevchenko.
(Titanium) (Metals, Effect of radiation on)

S/185/63/008/001/021/024
D234/D308

AUTHORS: Kuz'menko, P. P. and Kal'na, H. I.

TITLE: Heat effects and kinetics of ordering in Mg-Cd alloys

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 8, no. 1, 1963, 138-139

TEXT: Using the results of their previous papers the authors have obtained the formula

$$\frac{\Delta R}{\Delta R_o} c = (1 - e^{-(at)^b}) \qquad (2)$$

ΔR being the variation of electric resistance at a given stage, ΔR_o its variation during the whole transformation; c is the ratio of the resistance of the ordered phase to R. Double logarithm of $\Delta R_o/(\Delta R_o - c R)$ was plotted against the logarithm of time for all

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alloys investigated earlier. The experimental plots lie on straight lines, and two stages with different values of b can be seen for each temperature. A graph of the activation energy against Cd concentration is given. There are 3 figures.

ASSOCIATION: Kyyivs'kyy derzhuniversytet im. T. H. Shevchenka (Kiev State University im. T. H. Shevchenko)

SUBMITTED: June 7, 1962

KUZ'MENKO, P.P.; NOVIKOV, N.N. [Novykov, M.M.]; GORID'KO, N.Ya. [Horid'ko, M.IA.]

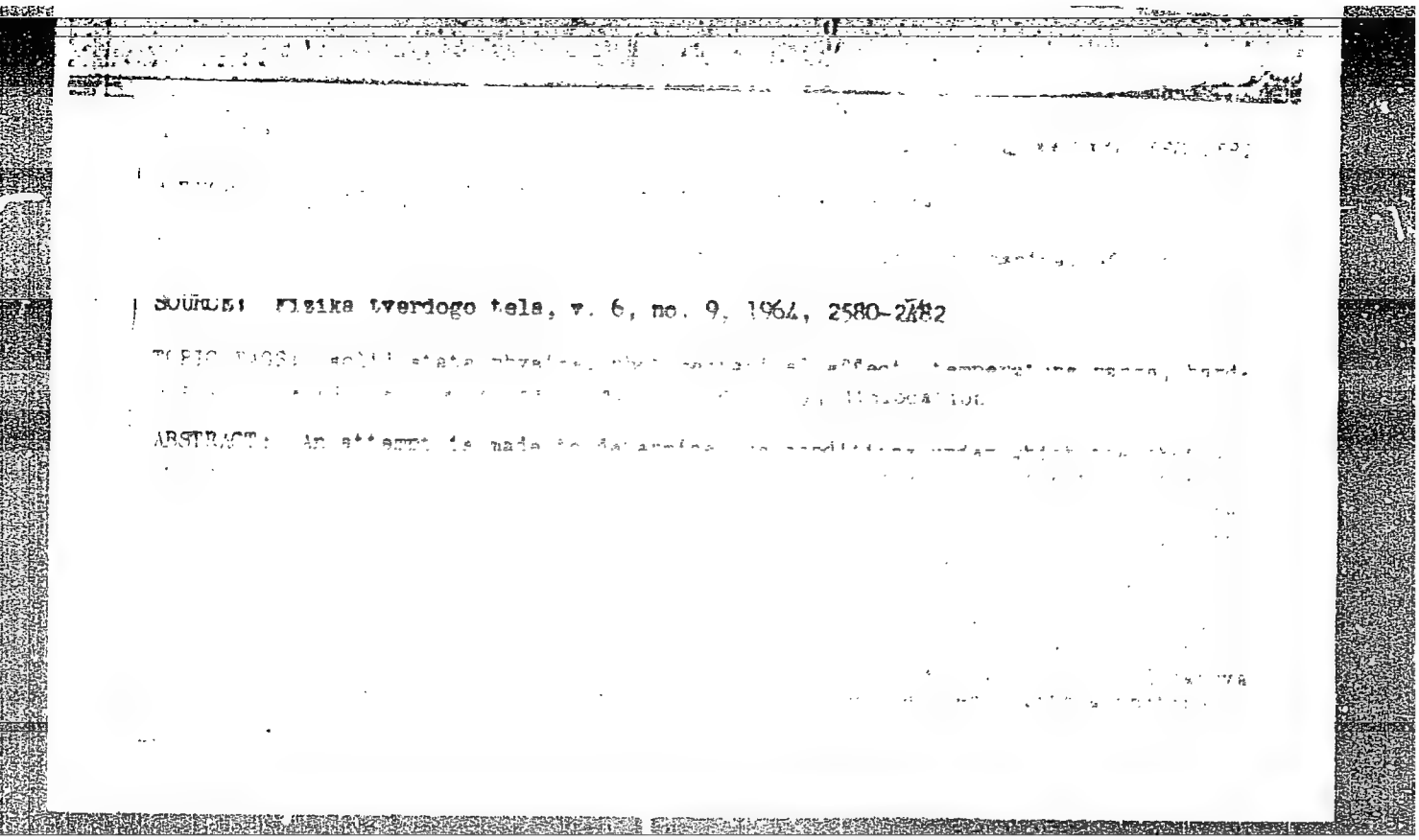
The anomalous properties of antimony. Ukr. fiz. zhur. 8 no.7:787-792 Jl '63. (MIRA 16:8)

1. Kiyevskiy gosudarstvennyy universitet im. Shevchenko.
(Antimony—Thermal properties)
(Antimony—Electric properties)

KUZ'MENKO, P.P.; KHAR'KOV, Ye.I. [Khar'kov, IE.I.]; LOZOVOY, V.I. [Lozovyi, V.I.]

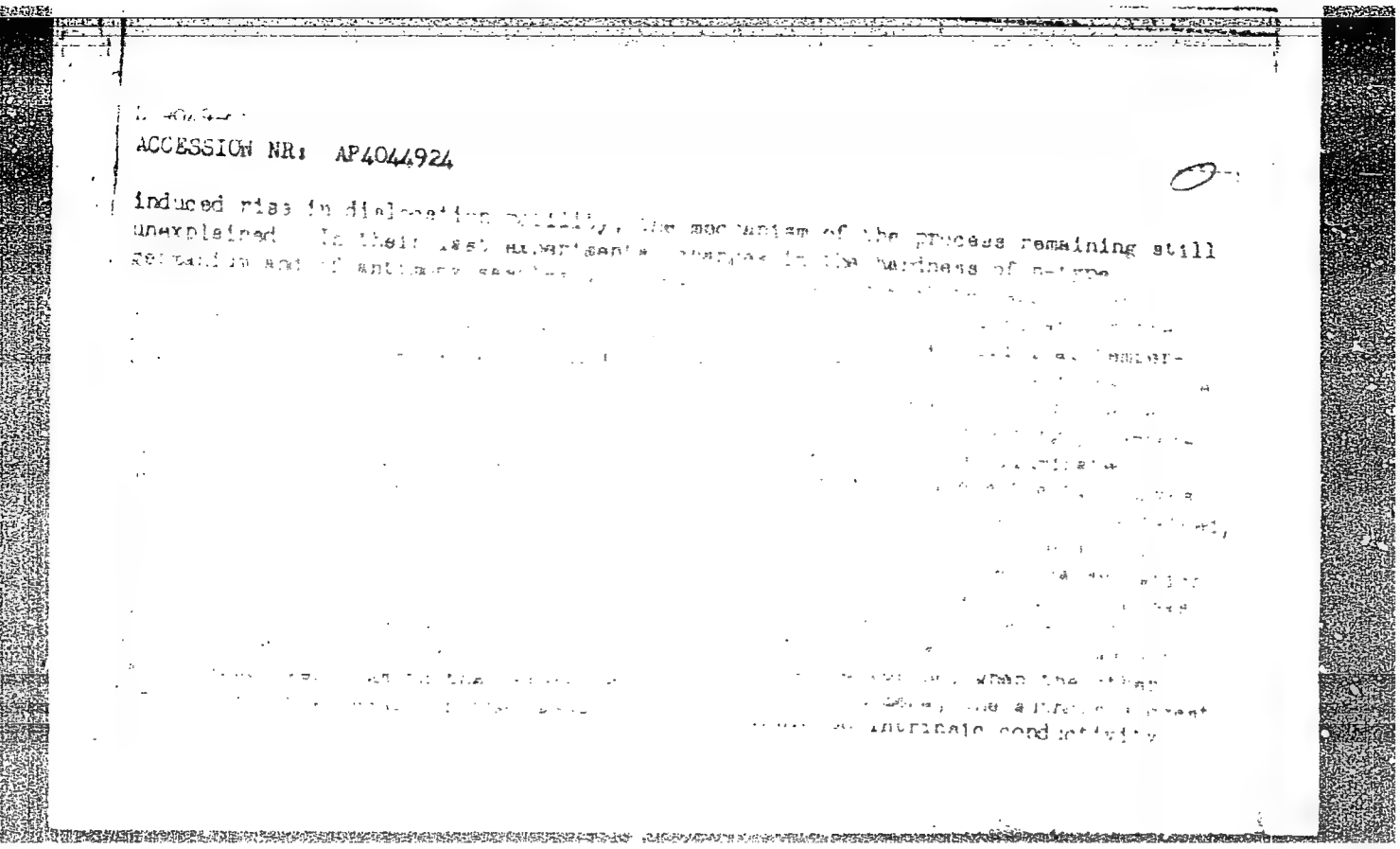
Electrotransmission of silver in liquid lead and cobalt in liquid tin. Ukr. fiz. zhur. 9 no.8:881-889 Ag '64.
(MIRA 17:11)

1. Kiyevskiy gosudarstvennyy universitet im. Shevchenko.



Source: Fizika tverdogo tela, v. 6, no. 9, 1964, 2580-2582

ABSTRACT:



ACCESSION NR: AP4044924

L 9049-65
ACCESSION NR: AP4044924

which occurs at 100-110C in the case of germanium, that is, when a temperature
[illegible] a merging of the two
curves. Orig. art. has: 3 figures.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet imeni T. G. Shevchenko
(Kiev State University)

L 16116-65 EWP(e)/EWT(m)/EWP(t)/EWP(b) Pf-4/Pad
ASD(a)-5/AFETR/ESD(t)/AFMDC/IJP(c)

ACCESSION NR: AP4044170 S/0185/64/009/008/0881/0889

AUTHOR: Kuz'menko, P. P.; Khar'kov, Ye. Y. (Khar'kov, Ye. I.); Lozovy*y, V. I. (Lozovoy, V. I.)

TITLE: Transfer of silver in liquid lead, and of cobalt in liquid tin by electric current

SOURCE: Ukrayins'ky*y fizy*chny*y zhurnal, v. 9, no. 8, 1964, 881-889

TOPIC TAGS: electrotransfer, silver, cobalt, electrolysis, liquid metals

ABSTRACT: The authors suggest a possible mechanism of the ions mobility in [illegible]

has: 4 figures, 2 tables

Card 1/2

L 16116-65

ACCESSION NR: AP4044170

ASSOCIATION: Ky*yivs'ky*y derzhuniversy*tet im.T. G. Shevchenka (Kiev State University)

SUBMITTED: 29Nov63 ENCL: 00

SUB CODE: IC, EM NO REF SOV: 014 OTHER: 006

Card 2/2

OSTROVSKIY, L.F.; KUZ'MENKO, P.P.

Mobility of silver in bismuth and of antimony in tin. Fiz. met. i metallo-ved. 17 no.1:78-82 Ja '64. (MIRA 17:2)

1. Kiyevskiy ordena Lenina gosudarstvennyy universitet im. Shevchenko.

KUZ'MENKO, P.P.; NOVIKOV, N.N.; GORLENKO, N.Ya.

Temperature range of the existence of the photomechanical effect. Fiz. tver. tela 6 no.9:2580-2582 S '64.
(MIRA 17:11)

1.Kiyevskiy gosudarstvennyy universitet imeni Shevchenko.

KUZ'MENKO, P.P.; KHAR'KOV, Ye.I. [Khar'kov, IE.I.]; [illegible], V.I. [Lozovyi, V.I.]

Electroconvective diffusion in liquid tin and lead. Ukr. fiz. zhur. 10 no.8:912-913 Ag '65. (MIRA 18:8)

1. Kiyevskiy gosudarstvennyy universitet im. Shevchenko.

GOLOTYUK, F.P. [Holotiuk, F.P.]; KUZ'MENKO, P.P.; KHAR'KOV, Ye.I. [Khar'kov, IE.I.]

Determining the coefficients of diffusion and electric resistance of impurities in liquid metals. Ukr. fiz. zhur. 10, no. 11:1227-1236 N '65. (MIRA 18:12)

1. Kiyevskiy gosudarstvennyy universitet imeni Shevchenko.
Submitted January 20, 1965.

KUZ'MENKO, P.P.; NOVIKOV, N.N. [Novykov, M.M.]; GORID'KO, N.Ya. [Horid'ko, M.IA.]; SALEY, V.S.

Use of the infrared polariscopy method in studying photomechanical and electromechanical effects. Ukr. fiz. zhur. 10 no. 11:1258-1259 N '65. (MIRA 18:12)

1. Kiyevskiy gosudarstvennyy universitet imeni Shevchenko.
Submitted February 15, 1965.

L 15158-66 EWT(1)/EWP(a)/EWT(m)/EWP(b) WW

ACC NR: AP6002029 SOURCE CODE: UR/0185/65/010/012/1359/1364

AUTHORS: Holotyuk, F. P. -- Golotyuk, F. P.; Kuz'menko, P. P.; Khar'kov, Ye. Y. -- Khar'kov, Ye. I.

ORG: Kiev State University im. T. G. Shevchenko (Kyyivs'kyy derzhuniversytet)

TITLE: A method of studying the mobility of atoms in liquid metals 21,44,55

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 10, no. 12, 1965, 1359-1364

TOPIC TAGS: liquid metal, metal diffusion, electric resistance, atom, particle motion

ABSTRACT: The method described is based on measuring the electrical resistance of the anode and cathode portion of a sample. The electrical resistance changes as a result of the change in the distribution of the impurity atoms in the sample. The equations for the rate of electric transport of the impurity, the characteristic time, and the diffusion coefficients obtained from a theoretical discussion of the method are applicable as long as one can neglect the flux of impurity atoms due to the concentration gradient. To measure the mobility of Sb atoms in a liquid alloy of Sn + 4 at.% Sb, quartz capillaries were filled with the liquid and were joined by a capillary which was heated.

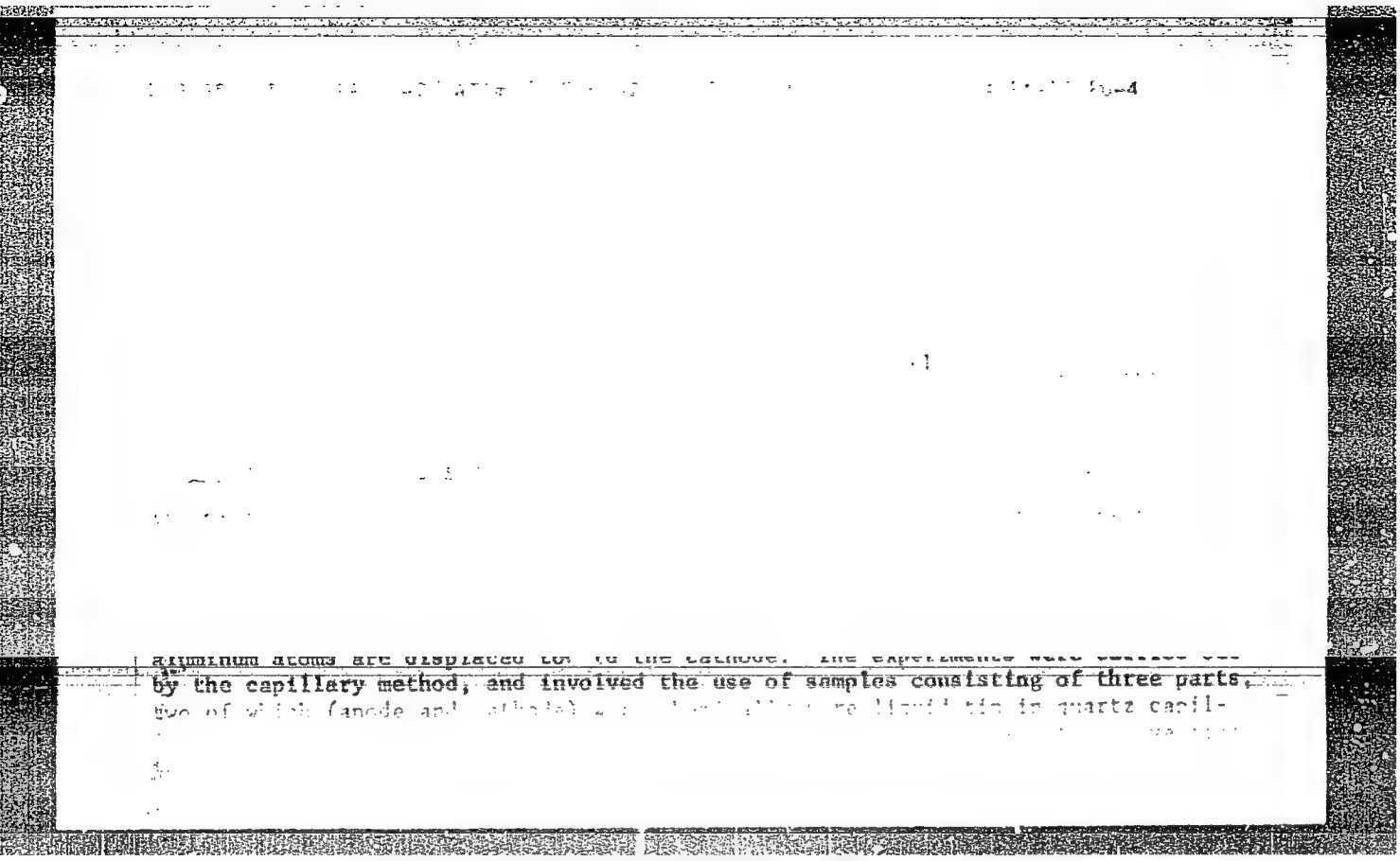
Card 1/2

L 15158-66
ACC NR: AP6002029 O

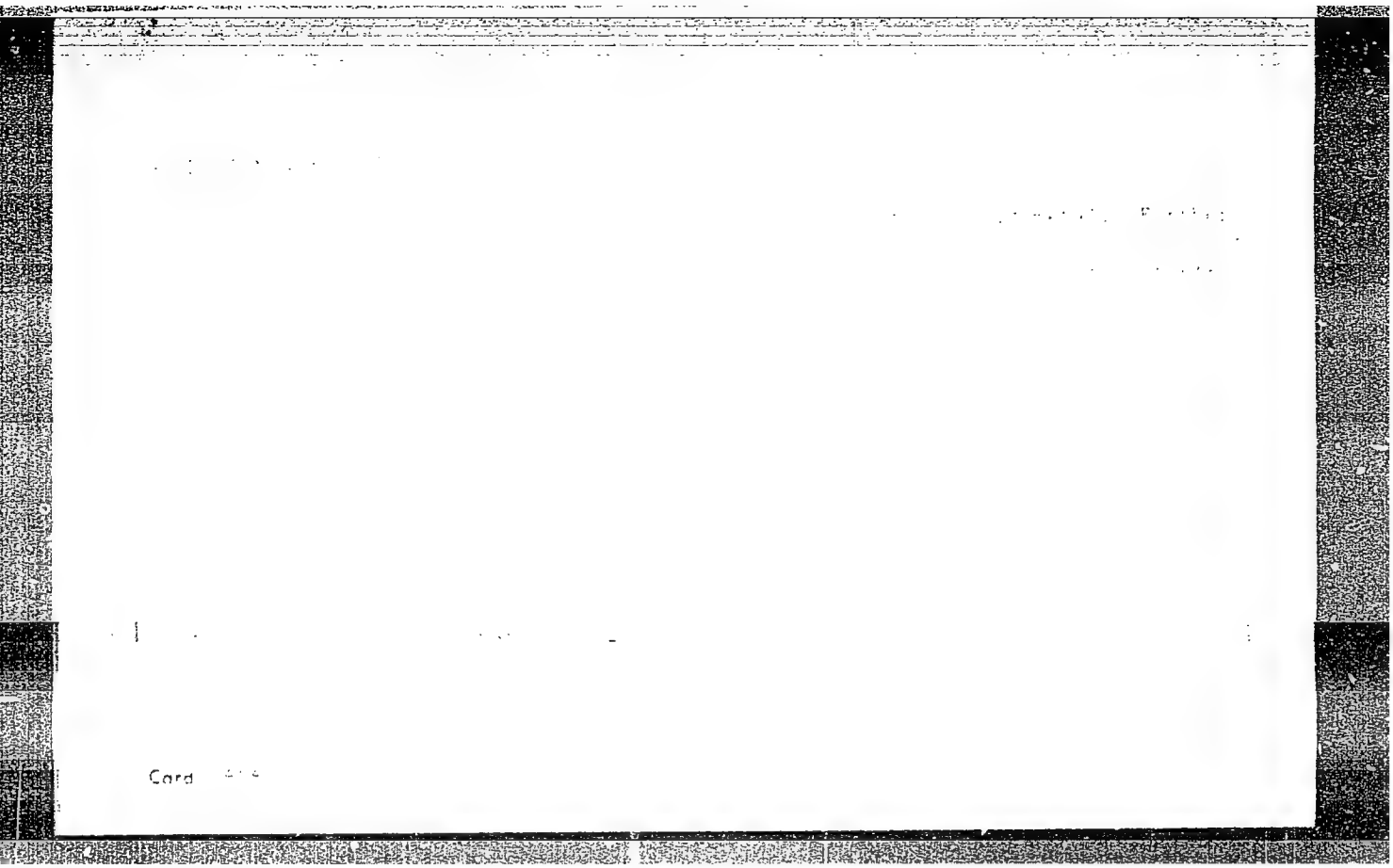
A current of 1--3 amp was passed through the sample at 300C for 6--8 hours. The potential drop was then measured approximately every hour, using a measuring current of 100 ma. The measurements were carried out in a nitrogen atmosphere at a pressure of 2--3 atmospheres. The successive increase in the resistance of the anode and corresponding decrease in the resistance of the cathode is explained by the motion of the Sb atoms towards the anode. The results were checked by the method of radioactive isotopes, the latter yielding mobilities and effective charges which were higher by 15 per cent. Orig. art. has: 12 formulas, 2 figures, and 2 tables.

SUB CODE: 20/ SUBM DATE: 05Apr65/ ORIG REF: 008/ OTH REF: 001

Card 2/2 vmb

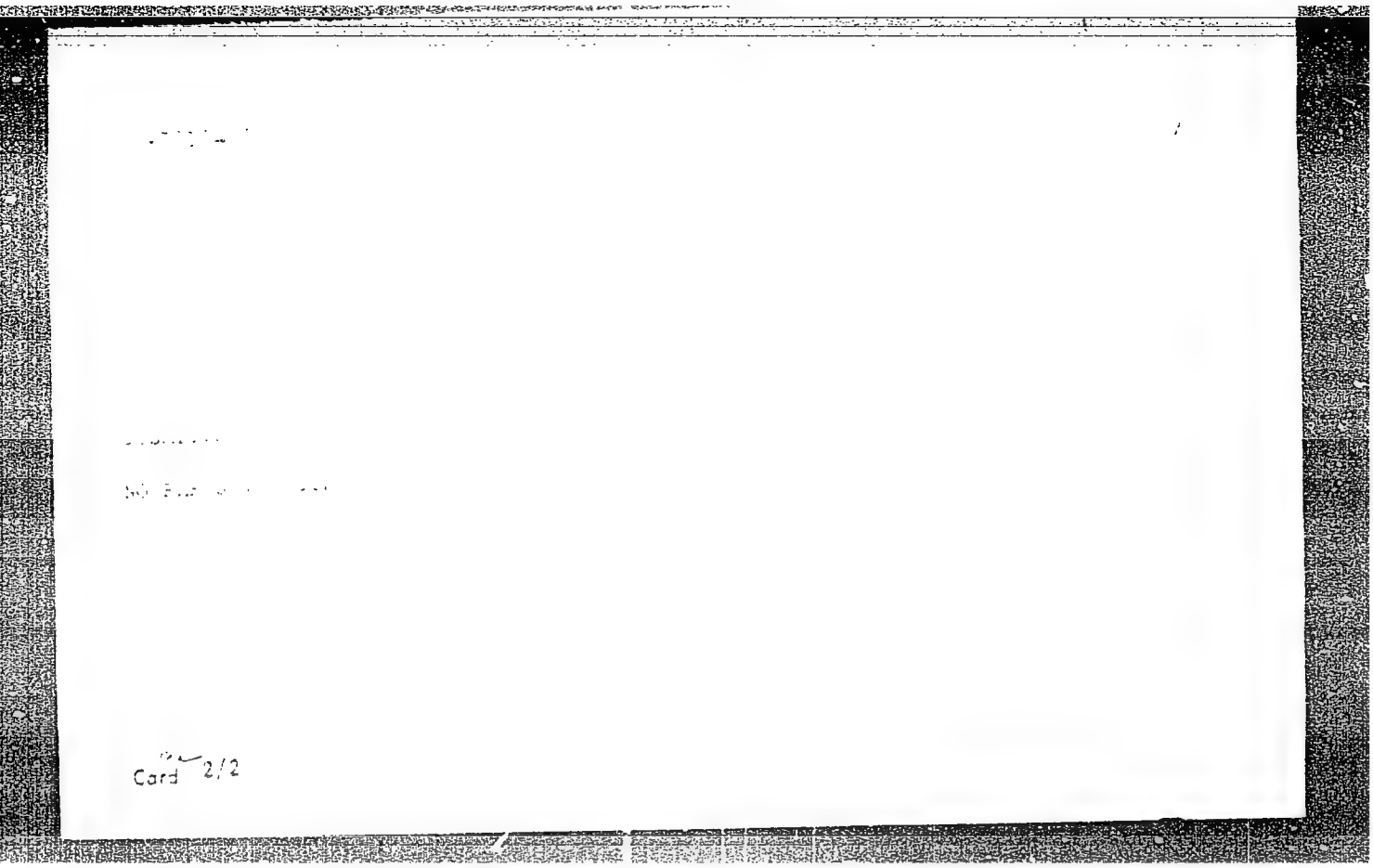


aluminum atoms are displaced to or to the cathode. The experiments were carried out by the capillary method, and involved the use of samples consisting of three parts, two of which (anode and cathode) were [illegible] in quartz capil-



ABSTRACT: Particles of [illegible] capillary tubes in an attempt to
proximately half the length of [illegible] electrical transfer of the metals in liquid [illegible]
[illegible] in the tubes.

Card 1/1



Card 2/2

L 24453-66 EWT(1)/EWT(m)/EWP(w)/T/EWP(t) IJP(c) JD/GS/AT
ACC NR: AT6010577 (N) SOURCE CODE: UR/0000/65/000/000/0096/0105

AUTHOR: Kuz'menko, P. P. (Doctor of physico-mathematical sciences); Novikov, N. N.; Gorid'ko, N. Ya.

ORG: Kiev State University im. T. G. Shevchenko (Kiyevskiy gosudarstvennyy universitet)

TITLE: The photomechanical effect in crystals and its physical nature

SOURCE: AN UkrSSR. Mekhanizm plasticheskoy deformatsii metallov (Mechanism of the plastic deformation of metals). Kiev, Naukova dumka, 1965, 96-105

TOPIC TAGS: photoeffect, semiconductor crystal, IR radiation, germanium, cadmium sulfide, antimony, titanium, hardness

ABSTRACT: The authors study the photomechanical effect (a reduction in the hardness of a material under illumination at room temperature) in *n*- and *p*-Ge, dislocationless *n*-Ge, CdS, antimony and titanium. The microhardness of the specimens was measured as a function of illumination intensity. The curves for *n*- and *p*- germanium and dislocationless germanium are all similar. The change in hardness for *p*- germanium is approximately 1/2 that for *n*- germanium. The surface hardness of *n*-

Card 1/2

L 24453-66

ACC NR: AT6010577

germanium decreases with an increase in illumination by approximately 57-60%, while that of *p*- germanium changes by 40%. The curves show saturation at approximately 20,000 lux. The softened layer extends to a depth of 1-2 μ. The photomechanical effect takes place only in the infrared region of the spectrum where the natural absorption region lies. The surface hardness of cadmium sulfide is reduced by approximately 40% with an increase in illumination intensity. Saturation begins at approximately 40,000 lux. The photomechanical effect in antimony reaches 45% with saturation at 30,000 lux. The depth of the softened layer is approximately 3 μ. Titanium shows an effect of 30% with saturation at 25,000 lux. The depth of the softened layer is 2.6 μ. The effect takes place in the infrared region of the spectrum in all specimens except cadmium sulfide. This is probably due to the fact that acceptor levels of dislocations in CdS lie rather deep with respect to the bottom of the conduction band, as distinct from germanium. A curve for microhardness in *n*-germanium as a function of current carrier concentration shows that an increase in current carriers reduces microhardness. It is suggested that a study should be made of the magnitude of the photomechanical effect as a function of light frequency. Orig. art. has: 8 figures.

SUB CODE: 20/ SUBM DATE: 23Jul64/ ORIG REF: 005/ OTH REF: 002

Card 2/2 dda

L 38622-66 T/EWP(t)/ETI/EWT(m) IJP(c) WW/JD/JG

ACC NR: AP6013908 SOURCE CODE: UR/0076/66/040/004/0818/0821

AUTHOR: Kuz'menko, P. P.; Onopriyenko, G. I.; Khar'kov, Ye. I.

ORG: Kiev State University im. T. G. Shevchenko (Kiyevskiy gosudarstvennyy universitet)

TITLE: Diffusion of certain admixtures in liquid Bi, Pb, and Sn

SOURCE: Zhurnal fizicheskoy khimii, v. 40, no. 4, 1966, 818-821

TOPIC TAGS: cadmium, bismuth, tin, liquid metal, metal diffusion

ABSTRACT: In this work the authors study the diffusion of Cd and Sn in liquid Bi; Sn in liquid Pb, and Co in liquid Sn in order to compare experimental results with theoretical conclusions concerning the diffusion of atoms in liquid metals in a broad temperature range. The diffusion coefficients were determined by the capillary method with the use of radioactive isotopes Sd^{115}, Sn^{113}, and Co^{60}. The results of measuring the diffusion coefficients showed that the average dispersion of the measurements was 11%. The temperature dependence of the diffusion coefficients in the systems studied by the authors deviate appreciably from exponential, which is in contrast to the data in the literature and is ascribed to the broader temperature range used by the authors. An interesting fact revealed was the marked difference of the diffusion coefficients of Sn and Sd in liquid Bi, es-

Card 1/2 UDC: 541.11

L 38922-66

ACC NR: AP6013908

pecially at high temperatures, e.g., at 900C the cadmium atoms diffused 5 times more quickly than the tin atoms. This contradicted the assertion made in the literature that the coefficients of diffusion of various admixtures in a given solvent are similar. The authors conclude that for more definite conclusions on the mechanisms of the diffusion of atoms in liquid metals a further accumulation of experimental data is needed. Orig. art. has: 5 tables, 2 figures, and 2 formulas.

SUB CODE: 20,11/ SUBM DATE: 16Sep64/ ORIG REF: 005/ OTH REF: 004

Card 2/2

ACC NR: AP6018534 SOURCE CODE: UR/0181/66/008/006/1732/1738

AUTHOR: Kuz'menko, P. P.; Novikov, N. N.; Gorid'ko, N. Ya.; Fedorenko, L. I.

ORG: Kiev State University im. T. G. Shevchenko (Kiyevskiy gosudarstvenny universitet)

TITLE: Photomechanical effect in germanium doped with weakly soluble elements

SOURCE: Fizika tverdogo tela, v. 8, no. 6, 1966, 1732-1738

TOPIC TAGS: germanium, hardening, photomechanical effect

ABSTRACT: The purpose of the investigation was to clarify the physical nature of the decrease in hardness of illuminated Ge, in view of the lack of information on the influence of impurities on this process and the lack of systematic research on the influence of impurities on the hardness of Ge in general. Tests were made on samples containing small concentrations of Sb, In, and Ga, and also on Sb containing Ge as an impurity. The Ge host in all tests was standard single crystal with carrier density not higher than 5×10^{13} cm^{-3}. The photochemical effect was measured with the PMT-3 instrument using a procedure described elsewhere (Izv. Vuzov. Fizika, No. 4, 22, 1964). In all cases it was found that the decrease in the hardness of the illuminated surface was strongly dependent on the amount of impurity. When the impurity concentration reached the solubility limit, the photomechanical effect decreased to zero. The character of the impurity had no influence, within the limits of errors, on either the characteristics of the photomechanical effect or the microhardness of the samples in darkness. It is therefore concluded that the governing factor in the

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ACC NR: AP6018534

properties of Ge is the quantity and not the type of impurity. In view of the complicated nature of the phenomenon, however, the authors caution that the results should be regarded only as preliminary. Orig. art. has: 8 figures and 2 tables.

SUB CODE: 20/ SUBM DATE: 01Nov65/ ORIG REF: 011/ OTH REF: 004

Card 2/2 MLP

83333
S/117/60/000/008/009/020
A002/A001

1.2300 only to 2408

AUTHORS: Us, N.P., Kuz'menko, P.Ye., Us, A.N.

TITLE: Combined Electric Welding of Aluminum Alloy Parts

PERIODICAL: Mashinostroitel', 1960, No. 8, p. 17

TEXT: The authors distinguish the following methods of welding aluminum alloy parts: a) the flux is applied directly to the welding rod and the place of welding (method of P.N. Benardos); b) the coating is applied to the electrode rod (method of N.G. Slavyanov); c) the coating is applied to the electrode rod and the welding is performed with a graphite electrode (combined method). At the Khar'kov "Serp i molot" Plant the combined method was introduced for restoring parts cast of АЛ-9 (AL-9) and АЛ-10 (AL-10) aluminum alloys because the first two methods have certain deficiencies. The introduction of the combined welding method reduced the cost of producing the СМД (SMD) diesel engine and eliminated rejects in casting and mechanical processing. The graphite electrodes are 200-300 mm long and 12-18 mm in diameter, depending on the thickness of the metal to be welded. Welding is performed with 250-350 amps. d.c. of reversed polarity. The aluminum welding rods contain 0.90% copper, 1.81% iron and 6.4% silicon and

Card 1/2

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S/117/60/000/008/009/020
A002/A001

Combined Electric Welding of Aluminum Alloy Parts

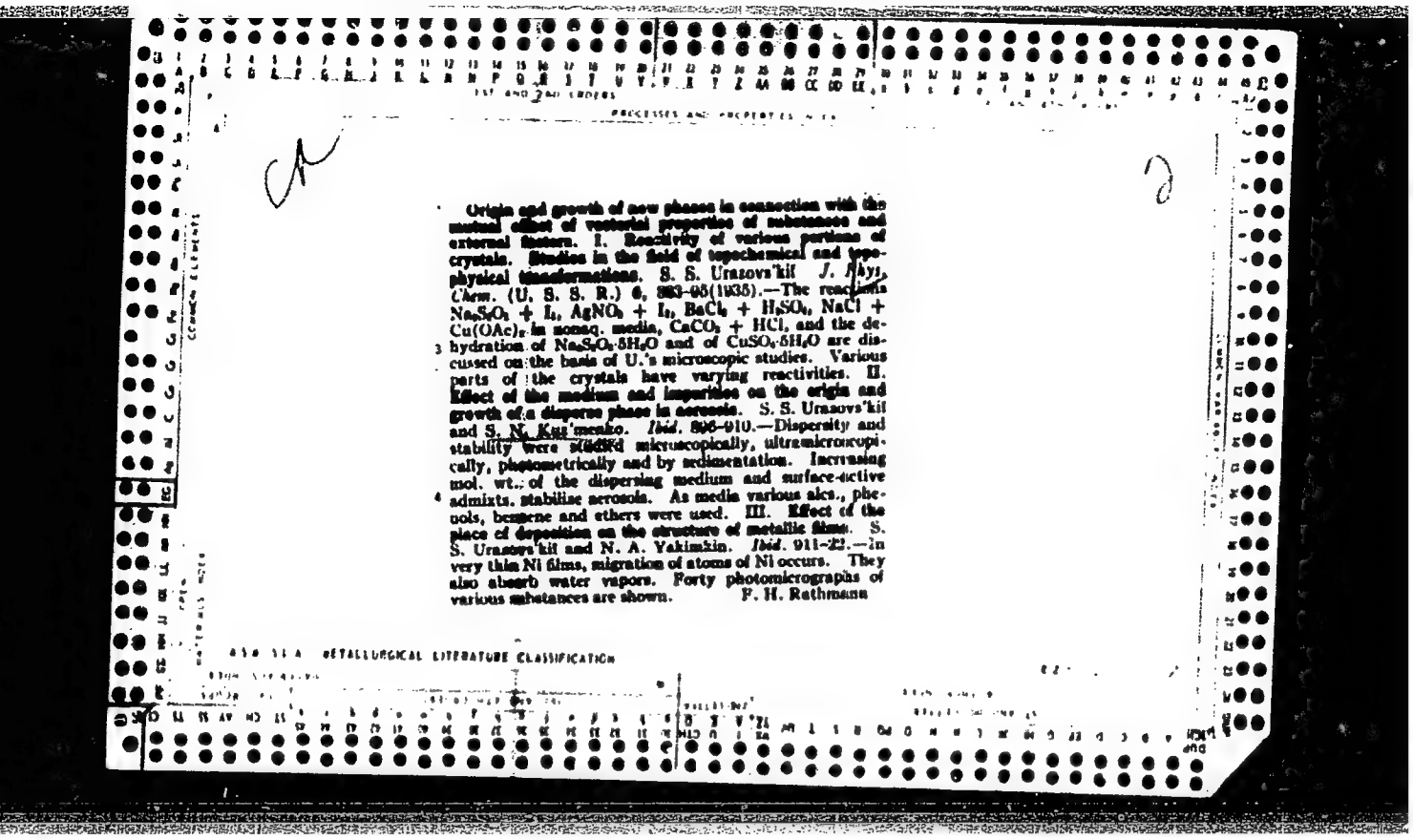
have diameters of 8-12 mm at 4-16 mm thickness of parts to be welded. The coating applied to the welding rods consists of 15% sodium chloride, 50% potassium chloride and 35% cryolite. For each 100 weight parts of the dry compound, 25-30 cm^3 water are added. The coating is applied with a brush to the welding rods, dried, and heated at 140-150°C for 30 minutes. Investigations of welds performed with this coating showed the monolithic structure, compactness and strength of the seam. There is 1 figure.

Card 2/2

KUZ'MENKO, S.D., Cand Agr Sci — (diss) "Comparative study of the economic and biological properties of simmenthalized, black-spotted, and Ukrainian white-head cattle raised under identical natural farm conditions." Kiev, 1959, 22 pp (Min of Agr UkSSR. Ukrainian Acad Agr Sci) 150 copies (KL, 36-59, 117)

KUZ'MENKO, S.F., inzh.; VISHNIVETSKIY, M.G.

Planetary transmissions of high capacity. Energomashinostroenie 8 no.5:34-35 My '62. (MIRA 15:5)
(Hydraulic turbines--Transmission devices)



Origin and growth of new phases in connection with the mutual effect of textural properties of substances and external factors. I. Reactivity of various portions of crystals. Studies in the field of topochemical and topophysical transformations. S. S. Urazovs'kiĭ *J. Phys. Chem.* (U. S. S. R.) 6, 883-95(1935).—The reactions $Na_2S_2O_3 + I_2$, $AgNO_3 + I_2$, $BaCl_2 + H_2SO_4$, NaCl + $Cu(OAc)_2$ in nonaq. media, $CaCO_3$ + HCl, and the dehydration of $Na_2S_2O_3 \cdot 5H_2O$ and of $CuSO_4 \cdot 5H_2O$ are discussed on the basis of U.'s microscopic studies. Various parts of the crystals have varying reactivities. II. Effect of the medium and impurities on the origin and growth of a disperse phase in aerosols. S. S. Urazovs'kiĭ and S. N. Kuz'menko. *Ibid.* 896-910.—Dispersity and stability were studied microscopically, ultramicroscopically, photometrically and by sedimentation. Increasing mol. wt. of the dispersing medium and surface-active admixts. stabilize aerosols. As media various alcs., phenols, benzene and ethers were used. III. Effect of the place of deposition on the structure of metallic films. S. S. Urazovs'kiĭ and N. A. Yakimkin. *Ibid.* 911-22.—In very thin Ni films, migration of atoms of Ni occurs. They also absorb water vapors. Forty photomicrographs of various substances are shown. F. H. Rathmann

A. E. S.

Geology

Effect of salt solutions on the stability of suspensions of Chasov-Yar clay No. 3 and Polanak kaolin. S. N. Kus'menko. *Byull. Khim. Obshchestva Mendeleeva*, 1940, No. 11, pp. 11-12; *Khim. Referat. Zhur.*, 4 [7-8] 94 (1941). M.Ho.

USSR/Engineering
Clays
Oil Reclamation

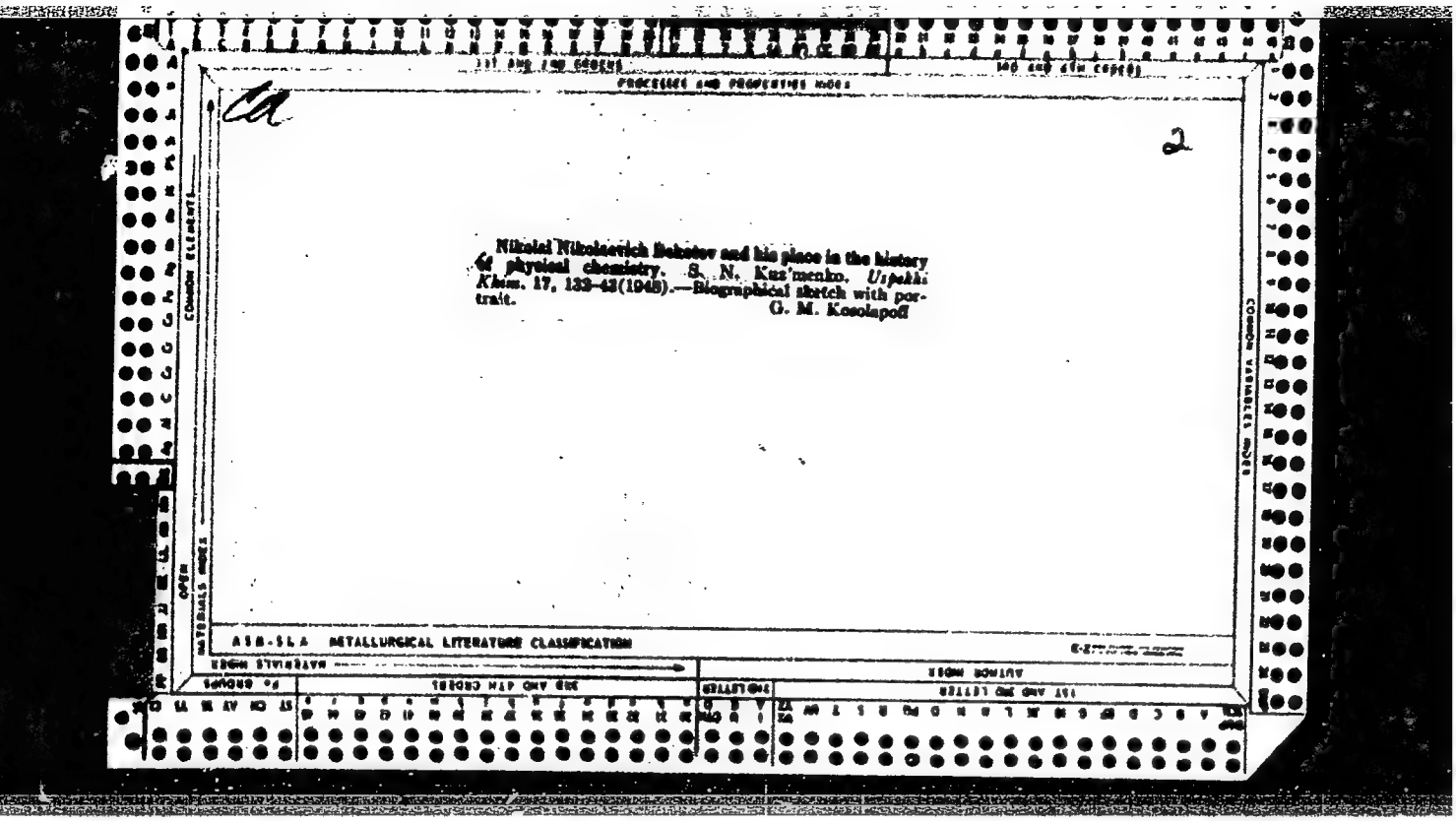
Feb 1948

"Use of Khar'kov 'Zelenka' Clay for the Reclaiming Industrial Oils," Ts. O. Gekhtman, Engr; Docent S. N. Kuz'menko, ½ p

"Elek Stants" No 2

Describes tests conducted at Khar'Kov city power station on subject clay. Compares results obtained from use of 'Zelenka' and those obtained from use of 'Gumbril,' which is usually used as recaliming material.

PA 61T39

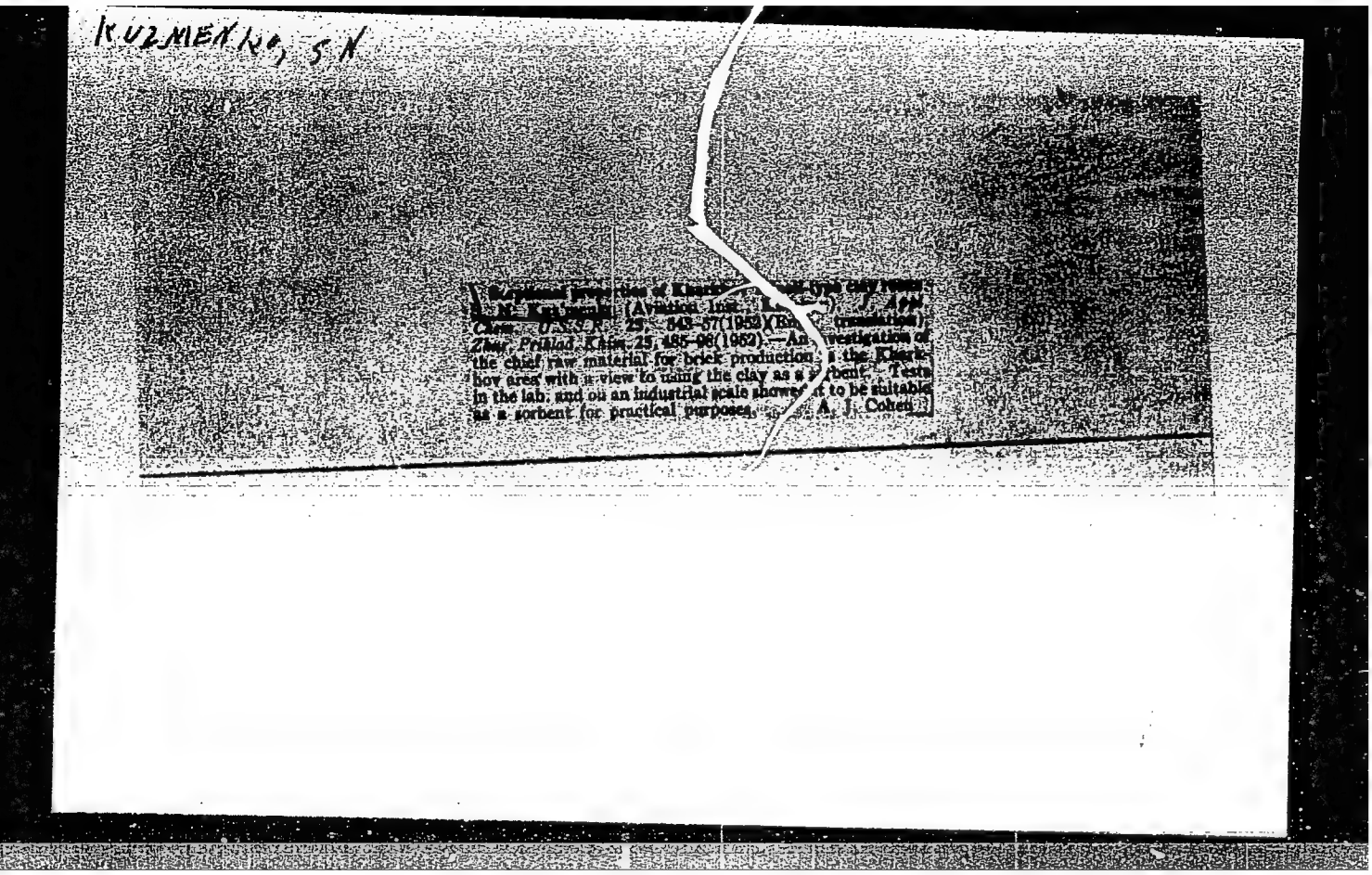


Nikolai Nikolaevich Beketov and his place in the history of physical chemistry. S. N. Kaz'menko. *Uspekhi Khim.* 17, 133–43(1948).—Biographical sketch with portrait.
G. M. Kosolapoff

KUZ'MENKO, S. N.

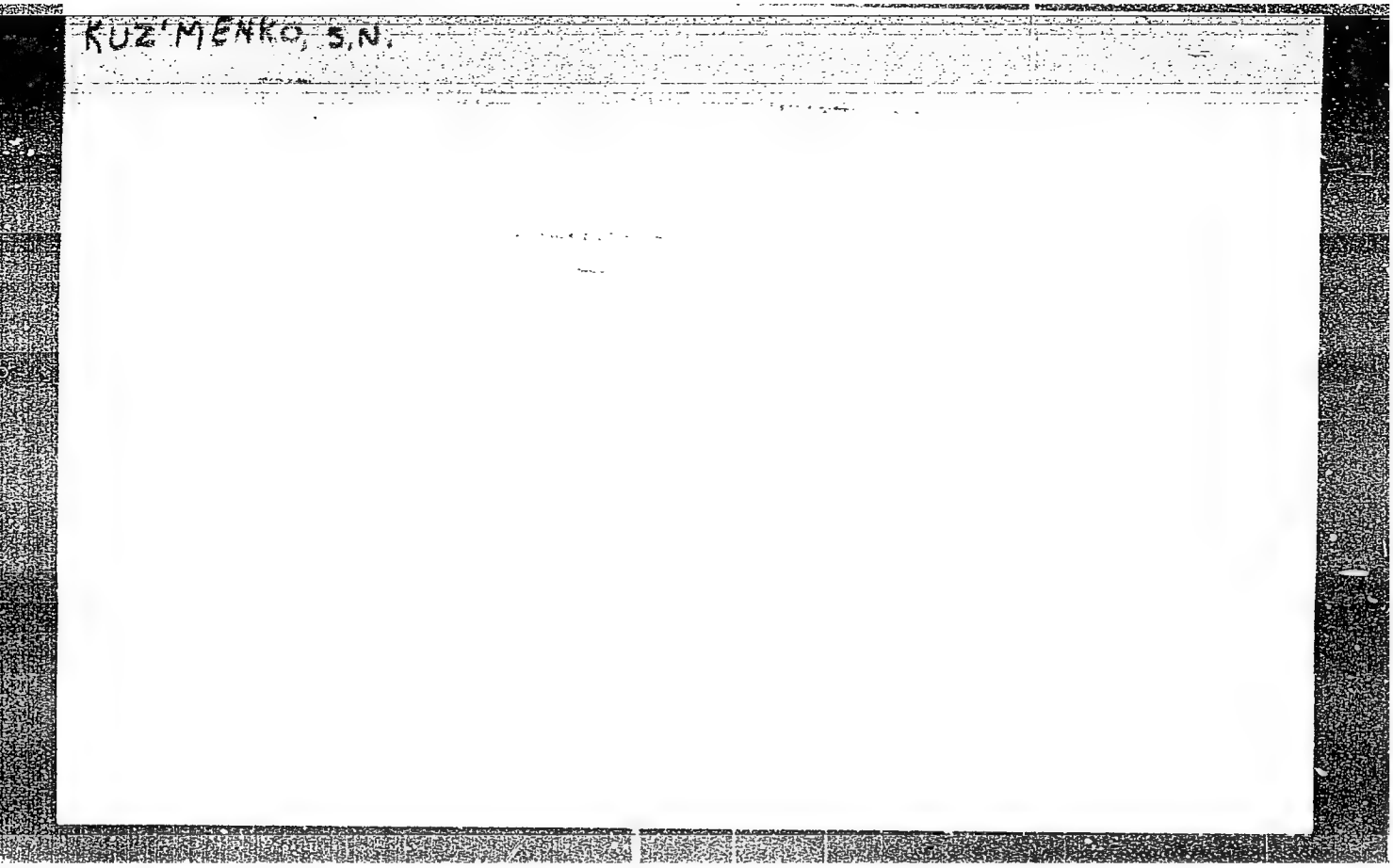
Kuz'menko, S. N. - "Some data on the history of the development of chemistry in Khar'kov", Soobshch. o nauch. rabotakh chlenov Vsesoyuz. khim. o-va im. Mendeleyeva, 1949, Issue 1,,p. 34-35.

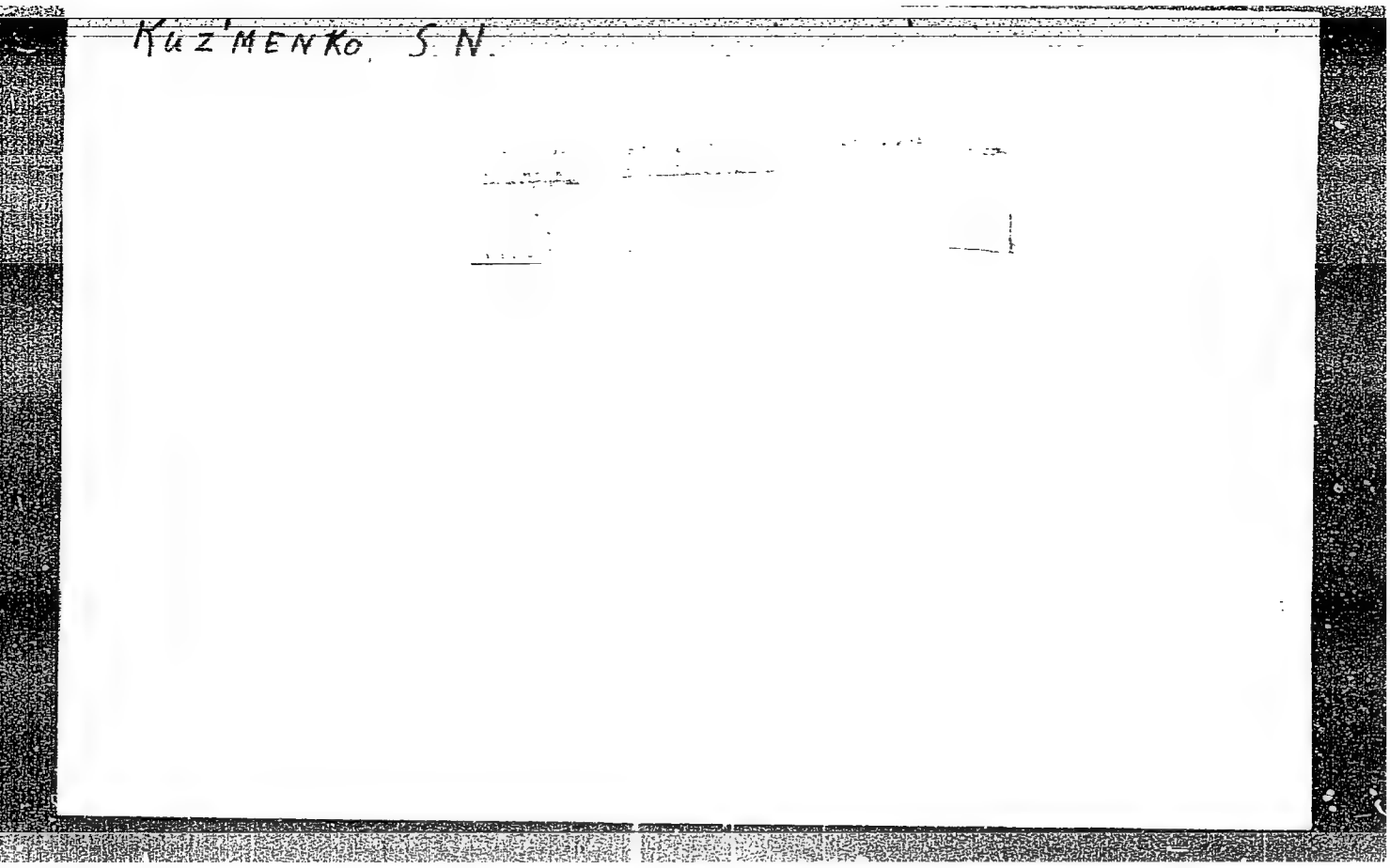
SO: U-4630, 16 Sept. 53, (Letopis 'Zhurnal 'nykh Statey, No. 23, 1949).



IKUZMENKO, S N

[illegible] (Aviation Inst. [illegible]) *J. Appl. Chem. U.S.S.R.* 25: 843-57(1952)(Russian translation); *Zhur. Prikład. Khim.* 25, 885-98(1952).—An investigation of the chief raw material for brick production, in the Kuznetsk-bov area with a view to using the clay as a sorbent. Tests in the lab. and on an industrial scale showed it to be suitable as a sorbent for practical purposes. A. J. Cohen





KUZ'MENKO, S. N.

KUZ'MENKO, S.N.

The Russian physicochemist Pavel Dmitrievich Khrushchev. Soob.o nauch.rab.chl.VKHO no.3:42-44 '54. (MIRA 10:10)
(Khrushchev, Pavel Dmitrievich, 1849-1909)

KUZ'MENKO, S.N.

On the book of F.D.Ovcharenko "Development by colloid chemistry in the Ukrainian S.S.R." Reviewed by S.N.Kuz'menko. Koll.zhur. 18 no.1:126-128 Ja-F '56. (MLRA 9-6)
(Ukraine--Colloids) (Ovcharenko, F.D.)

AUTHORS: Kuz'menko, S.N., Kurilenko, L.Ya. SOV/[illegible]-32-2-5/56

TITLE: Sorption Properties of Romny and Revovskaya Clays of the UkrSSR (Sorbtsionnyye svoystva romenskoy i revovskoy glin USRSR)

PERIODICAL: Zhurnal prikladnoy khimii, 1959, Vol XXXII, Nr 2, pp 268-272 (USSR)

ABSTRACT: Romny and Revovskaya clays were compared with clays of the gumbrin and tripoli-earth type as to their sorption properties, especially in the regeneration of used transformer and aviation oil. The chemical and mechanical analysis of the clays is given in Tables 1 and 2. The sorption of the vapors of the aromatic hydrocarbons C_6H_6, $C_6H_5CH_3$, and $C_6H_4(CH_3)_2$ was determined by the static exsiccator method. It has been shown that the sorption properties of the Romny and Revovskaya clays for these vapors are below those of gumbrin, tripoli-earth, etc. The sorption of aqueous solutions of organic dyes, like malachite green, methylene blue, and basic fuchsin was also investigated. Revovskaya clay showed good sorption properties for these substances which were even higher than in gumbrin. For the regeneration of oils the clays were ground and passed a sieve of 1,600 openings per cm^2. Then they were dried for one hour at 110-120°C. The contacting lasted 1 hour

Card 1/2

Sorption of Properties of Komny[illegible] Reservoir Clays of the USSR

at a temperature of 80°C followed by settling during 1 day and filtering. The color of the oil changes during the treatment. The used transformer and aviation oils after regeneration corresponded to the specifications of the State Standard GOST.
There are 6 tables and 10 Soviet references.

SUBMITTED: June 21, 1957

Card 2/2

KUZMENKO, Stepan Yegorovich; TOROPOV, A., red.; TROYANOVSKAYA, N., tekhn. red.

[Master of welding] Master ognennogo dela. Moskva, Gospolitizdat, 1962. 31 p. (MIRA 15:6)

1. Zhurnalist gazety "Pravda" (for Kuzmenko).
(Ulesov, Aleksei Aleksandrovich)

KUZ'MENKO, V., inzh.

Measuring the torque on ship power plant shafts by the phase-shift method. Rech. transp. 20 no.5:53-54 My '61. (MIRA 14:5)
(Torque--Measurement) (Marine engineering)

KRYLOV, A.P. (Kiyev); KUZ'MENKO, V.A. (Kiyev); VETROV, I.Ye., inzh.(Kiyev)

Larger volume of transportation with a smaller expenditure of fuel; from the experience of the Southwestern Railroad. Zhel. dor. transp. 45 no.3:70-72 Mr '63. (MIRA 16:6)

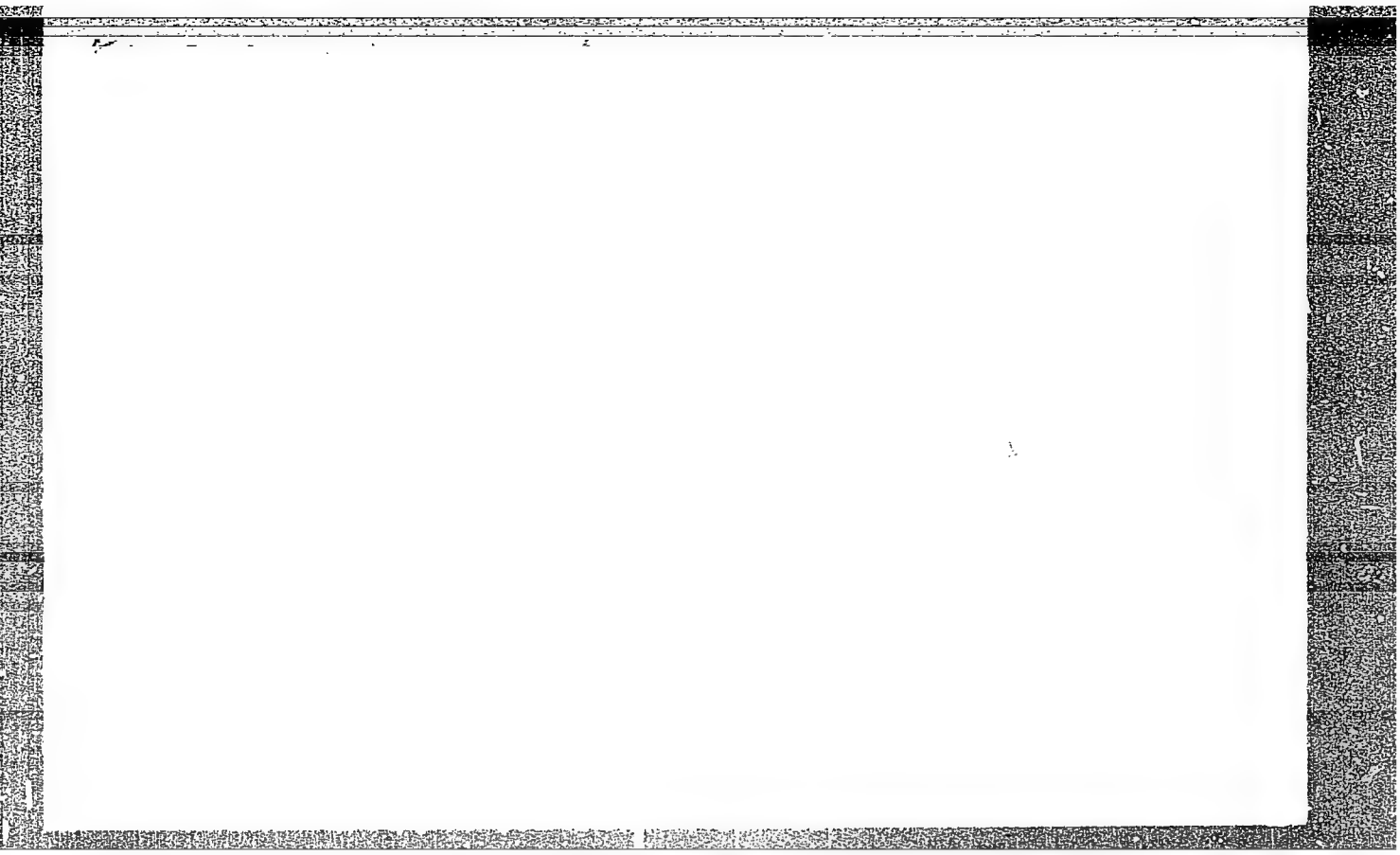
1. Nachal'nik sluzhby lokomotivnogo khozyaystva Yugo-Zapadnoy zheleznoy dorogi (for Krylov). 2. Nachal'nik lokomotivnogo depo Darnitsa Yugo-Zapadnoy zheleznoy dorogi (for Kuz'menko). 3. Lokomotivnoye depo Darnitsa Yugo-Zapadnoy zheleznoy dorogi (for Vetrov).

(Railroads--Management)
(Diesel locomotives)

GUS'KOV, V.V., kand. tekhn. nauk; KUZ'MENKO, V.A., inzh.;
BADALOV, M.M., inzh.

Selecting optimal parameters for wheeled tractors. Trakt.
i sel'khozmash. 33 no.10:1-4 O '63. (MIRA 17:1)

1. TSentral'nyy nauchno-issledovatel'skiy institut
mekhanizatsii i elektrifikatsii sel'skogo khozyaystva
nechernozemnoy zony SSSR.



APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R000928020(

AUTHOR: Kuz'menko, V.A. SOV-21-58-9-3/28

TITLE: Arrangement for Testing the Endurance of Materials at High-Frequency Loading (Ustanovka dlya ispytaniya materialov na vynoslivost' pri vysokochastotnom nagruzhenii)

PERIODICAL: Dopovidi Akademii nauk Ukrains'koi RSR, 1958, Nr 9, pp 946 - 950 (USSR)

ABSTRACT: An arrangement for testing the endurance of materials for symmetrical variations of tension alternating with compression was employed. The vibration frequency was 20,000 cycles per second. The principle of its operation consists in the inducement of longitudinal vibrations of the specimen in its resonance frequency by means of a magnetostriction vibrator with a double core. The arrangement was equipped with an electronic device which permits making the tests both with independent control of vibration frequency and with self-vibrations. Tests were performed with steel and metallocera-mic specimens, and the results of the steel tests are pre-sented in the graphically formed fatigue curves. There are

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SOV-21-58-9-8/28

Arrangement for Testing the Endurance of Materials at High-Frequency Loading

2 photos, 1 block-diagram, 1 graph and 6 references, 1 of which is Soviet, 1 American, 2 English and 2 French.

ASSOCIATION: Institut metallokeramiki i spetsial'nykh splavov AN UkrSSR (Institute of Metalloceramics and Special Alloys of the AS UkrSSR)

PRESENTED: By Member of the AS UkrSSR, S.V. Serensen

SUBMITTED: March 28, 1958

NOTE: Russian title and Russian names of individuals and institutions appearing in this article have been used in the transliteration.

1. Materials--Mechanical properties 2. Materials--Test methods
3. Mathematics

Card 2/2

7(1) 15(6) SOV/32-24-11-27/37

AUTHOR: Kuz'menko, V. A.

TITLE: Determination of Elasticity Constants of Materials by Means of Longitudinal Ultrasonic Oscillations
(Opredeleniye uprugikh postoyannykh materialov pri pomoshchi prodol'nykh ul'trazvukovykh kolebaniy)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol 24, Nr 11, pp 1407-1408 (USSR)

ABSTRACT: The elasticity moduls E and G as well as the Poisson coefficient μ were determined according to known equations. The frequency of the longitudinal oscillations in the test bar were measured in a special piezo-electric device (Ref 1). The speed C_2 was determined by means of an ultrasonic caliper of the V4-8R type. An analysis of the error in the determination of the values of μ and G is very important, as the speed C_1 and C_2 hardly differ from each other. It is pointed out that the relative error of determination of the elasticity constants μ and G increases when the value of μ is reduced. The measuring and calculating results for test bars of carboniferous steel are given which were obtained according

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Determination of Elasticity Constants of Materials by Means of Longitudinal Ultrasonic Oscillations

SOV/32-24-11-27/37

to the method described. The results show that this method of determining the elasticity constant can also be applied to other cast materials as their Poisson coefficient, for the larger part of them, does not exceed the value of 0,28. Furthermore, also metalloceramic materials (chromium carbide, tungsten carbide, zirconium boride, etc.) can be determined. There are 1 figure, 1 table, and 2 Soviet references.

ASSOCIATION: Institut metallokeramiki i spetsial'nykh splavov Akademii nauk USSR
(Institute of Powder Metallurgy and Special Alloys of the Academy of Sciences, UkrSSR)

Card 2/2

KUZMENKO, V.A.

PHASE I BOOK EXPLOITATION SOV/3624

Akademiya nauk Ukrainskoy SSR. Institut metallokeramiki i spetsial'-nykh splavov

Metallokeramicheskiye materialy i metody ikh issledovaniya; informatsionnyye materialy (Cermet Materials and Methods of Their Analysis; Information Material) Kiyev, Izd-vo AN UkrSSR, 1959. 55 p. 1,500 copies printed.

Ed. of Publishing House: I.V. Kisina; Tech. Ed.: A.M. Lisovets Editorial Board: I.N. Frantsevich, I.M. Fedorchenko, G.S. Pisarenko, G.V. Samsonov (Resp. Ed.), V.N. Yeremenko, and V.N. Paderno.

PURPOSE: This collection of articles is intended for scientific workers, designers, and engineering and technical workers in the metallurgical, machinery-manufacturing and other branches of industry.

COVERAGE: In this collection of articles the authors describe the production of carbides, nitrides and other heat resisting compounds, giving their physicochemical and mechanical properties. Their thermal processing and the processing installations are also described. A new method is proposed for the production of rods from refractory compounds. Certain compounds are analyzed, and the energy dissipation in materials during high-frequency mechanical vibrations is determined. No personalities are mentioned. There are 7 schematic drawings, 7 diagrams, 6 tables and 17 references, 16 of which are Soviet.

1/3

KUZ'MENKO, V. A. Cand Tech Sci -- (diss) "Study of the characteristics of strength by means of mechanical high-frequency vibrations." Kiev, 1959 10 pp with graphs (Acad Sci UkSSR. Inst of Construction Mechanics), 110 copies (KL, 46-59, 137)

SOV/170-59-6-6/20

24(6)

AUTHOR: Kuz'menko, V.A.

TITLE: Steel Fatigue in High Frequency Loading

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1959, Nr 6, pp 41-46 (USSR)

ABSTRACT: This investigation was undertaken in order to study the strength of materials in loading specimens at a frequency of 20 kc. Fatigue tests at such a high frequency make it possible to reduce sharply duration of experiments, which is of practical and scientific interest. The block diagram of an installation employed for these tests is shown in Figure 1 and the manner of its operation is described in detail. The excitation of oscillations is induced by a magnetostriction vibrator fed by alternating current of the 20 kc frequency. Stresses in the critical section of a specimen tested are determined by measuring the amplitude of vibrations of its butt with the aid of a 800-fold magnification microscope; the accuracy of amplitude measurement amounts to 2%. Carbon steel specimens of two shapes, shown in Figure 2, were tested. The fatigue curves plotted according to the results of tests are shown in Figure 3. The fatigue limit

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SOV/32-25-3-36/62

25(2)

AUTHOR: Kuz'menko, V. A.

TITLE: Apparatus to Determine the Young Modulus at High Temperatures (Ustanovka dlya opredeleniya modulya Yunga pri vysokikh temperaturakh)

PERIODICAL: Zavodskaya Laboratoriya, 1959, Vol 25, Nr 3, pp 351-353 (USSR)

ABSTRACT: In the apparatus described the dynamic method is applied to the determination of the Young modulus E. The Young modulus is determined in measuring the frequency of longitudinal oscillations f in the case of rod samples at different temperatures according to the equation

$E = 4\varrho f^2 l^2 \Delta^2$ (ϱ = density of the sample, l = length of the rod sample, Δ = correction according to Reley). The sample is vertically (Fig 1) put into an electric oven and on the lower end connected with the vibrator, whereas from the upper end the oscillations of the sample are transmitted to a piezoelectric element (barium titanate foil) over a light ceramic rod. The voltage of the element is transmitted to an oscilloscope by means of an amplifier. The vibrator is fed by a generator ZG-12.

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Apparatus to Determine the Young Modulus at High Temperatures

The temperature in the oven is measured by thermocouples with a direct-current potentiometer PP. Diagrams obtained in connection with testing the steel 2Kh13 (Cr = 13.08%, C = 0.26%) are given (Fig 2). Measurements of the eigenfrequency of the longitudinal oscillations of samples at normal temperature were carried out by a special piezoelectric apparatus (Ref 2) with an accuracy of 0.05%. For the determination of the frequency a quartz-heterodyne of the 528-type was used. There are 2 figures and 2 Soviet references.

ASSOCIATION: Institut metallokeramiki i spetsial'nykh splavov Akademii nauk Ukrainskoy SSR (Institute of Metalloceramics and Special Alloys of the Academy of Sciences, UkrSSR)

Card 2/2

28(5) SOV/32-25-9-31/53

AUTHOR: Kuz'menko, V. A.

TITLE: On the Dynamic Method for Determination of Young's Modulus at High Temperatures

PERIODICAL: Zavodskaya laboratoriya, 1959, Vol 25, Nr 9, pp 1107 - 1108 (USSR)

ABSTRACT: The author investigated the influence exerted by uneven temperature distribution on the amount of Young's modulus in a rod-shaped sample, using the dynamic method of determination. Tests were made on special installation described in reference 1, longitudinal oscillations of the sample occurring. Tests were made on two samples 8 mm thick and 110 mm long, which were turned down from the same rod of fireproof steel EI612. Measurements on the one sample were made under even heating (H) and on the second sample under uneven heating (H). The resulting diagrams (Fig) show that though the (H) of the 2nd sample was fairly uneven, there was no great difference noticeable in the two diagrams. The error in the determination of Young's modulus rises with temperature, and only at 950° it attains a noticeable value (+ 8%), so that even temperature

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On the Dynamic Method for Determination of Young's Modulus SOV/32-25-9-31/53
at High Temperatures

distribution along the sample becomes necessary only with specially precise measurements. A method of calculating Young's modulus, with regard to uneven heating of the sample (sample center hotter than sample ends), is then given. The proposed method of calculation allows for the use of simpler constructed test arrangements since the sample ends need not be heated and Young's modulus nevertheless can be determined at high temperatures. There are 1 figure and 1 Soviet reference.

ASSOCIATION: Institut metallokeramiki i spetsial'nykh splavov Akademii nauk USSR (Institute for Metal Ceramics and Special Alloys of the Academy of Sciences of the UkrSSR)

Card 2/2

PHASE I BOOK EXPLOITATION SOV/5303

Nauchno-tekhnicheskoye soveshchaniye po dempfirovaniyu kolebaniy. Kiyev, 1958.

Trudy Nauchno-tekhnicheskogo soveshchaniya po dempfirovaniyu kolebaniy, 17 - 19 dekabrya 1958 g. (Transactions of the Scientific and Technical Conference on the Damping of Vibrations, Held 17 - 19 December, 1958) Kiyev, Izd-vo AN UkrSSR, 1960. 178 p. 2,000 copies printed.

Sponsoring Agency: Akademiya nauk Ukrainskoy SSR. Institut metallokeramiki i spetsial'nykh splavov.

Editorial Board: I. N. Frantsevich, G. S. Pisarenko (Resp. Ed.), G. V. Samsonov, V. V. Grigor'yeva, and A. P. Yakovlev; Ed. of Publishing House: I. V. Kisina; Tech. Ed.: A. A. Matveychuk.

COVERAGE: The book contains 27 articles dealing with principal results of theoretical and experimental investigations of energy dissipation in mechanical vibrations carried out in the Soviet Union from 1956 to 1958. Problems of energy dissipation in materials and factors affecting it are discussed. Purportedly new methods of experimental investigation of damping of vibrations are presented. Attention is given to the recently developed nonlinear theory of calculating vibrations in elastic systems, taking energy dissipation into account. Attempts to analyze internal energy dissipation in materials using methods of mathematical statistics are discussed. Some articles deal with engineering problems in dynamics, in which damping is claimed to play a highly substantial part. Aspirant N. I. Mukhin, of the Kiyev Polytechnic Institute, is mentioned. References accompany some of the articles.

SOV/5303

Card 5/7

28000

10.8100 1413, 1327, 2608

S/194/61/000/004/046/052
D266/D302

AUTHOR: Kuz'menko, V.A.

TITLE: Determining the elastic constants of materials with the aid of longitudinal ultrasonic waves

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 4, 1961, 16, abstract 4 E125 (V sb. Primeneniye ul'trazvukovykh kolebaniy dlya issled. svoystv. kontrolya kachestva i obrabotki metallov i splavov, Kiev, AN USSR, 1960, 68-73)

TEXT: A method is described for determining the elastic moduli E and G and that of Poisson's ratio μ at normal and high temperatures (up to 1200°C) employing rod samples. Mathematical formulae are derived, the errors of the measurements are indicated and results are given for steels and some heat resistant alloys. [Abstracter's note: Complete translation]

Card 1/1

KUZ'MENKO, V.A.

PHASE I BOOK EXPLOITATION SOV/6342

Pisarenko, Georgiy Stepanovich, Valeriy Trofimovich Troshchenko, Vsevolod Georgiyevich Timoshenko, Vasiliy Aleksandrovich Kuz'menko, Georgiy Vakhtangovich Isakhanov, Georgiy Nikolayevich Tret'yachenko, Boris Alekseyevich Gryaznov, Nikolay Vasil'yevich Novikov, Vasiliy Nikitich Rudenko, and Rufina Gerasimovna Shumilova

Prochnost' metallokeramicheskikh materialov i splavov pri normal'nykh i vysokikh temperaturakh (Strength of Sintered Materials and Alloys at Room and High Temperatures) Kiyev, Izd-vo Akademii nauk UkrSSR, 1962. 274 p. Errata slip inserted. 2400 copies printed.

Sponsoring Agency: Akademiya nauk Ukrainskoy SSR. Institut metallokeramiki i spetsial'nykh splavov.

Resp. Ed.: G. S. Pisarenko, Corresponding Member, Academy of Sciences USSR; Ed.: I. V. Lebedev; Tech. Ed.: Yu. B. Dakhno.

Card ~~1/9~~ 1/2

PURPOSE: The book is intended for engineers, scientific research workers, aspirants, and students concerned with problems of the strength of sintered materials and structural parts.

COVERAGE: The book reviews the results of studying the strength, ductility, and elasticity of materials and structural parts produced by powder-metallurgy methods and presents brief information on these methods. Particular attention is given to methods of experimental investigation of physical and mechanical characteristics of heat-resistant sintered materials with specific properties, and to the description of a number of testing units developed for these investigations. Some problems of the theory of the strength of brittle sintered materials and high-porosity ductile materials are discussed. Laws governing changes in characteristics of strength and elasticity under the effect of various factors are outlined. The appendix includes reference tables with data on the basic mechanical characteristics of a number of sintered materials. The assistance of members of the Powder Metallurgy Institute V. I. Kovpak, Yu. A. Kashtalyan, L. V. Kravchuk. A. P. Yakovlev, V. K. Kharchenko, V. K. Kuz'menko, and V. A. Chebotarev is acknowledged. There are 141 references, mostly Soviet.

KUZ'MENKO, V.A. [Kuz'menko, V.O.] (Kiyev)

Effect of shear and inertia of rotation on lateral vibrations of rods. Prykl.mekh. 8 no.4:389-393 '62. (MIRA 15:9)

1. Institut metallokeramiki i spetsial'nyk splavov AN USSR.
(Elastic rods and wires—Vibration)

KUZ'MENKO, V. A. [Kuz'menko, V. O.]

Activity of the seminar on mechanics at the Department of Technical Sciences of the Academy of Sciences of the Ukrainian S.S.R. at the end of 1961 and in the first half of 1962. Prykl. mekh. 8 no.6:684-686 '62. (MIRA 15:10)

(Academy of Sciences of the Ukrainian S.S.R.)

S/032/62/028/006/019/025
B108/B104

AUTHOR: Kuz'menko, V. A.

TITLE: Determination of the Young modulus by dynamic methods

PERIODICAL: Zavodskaya laboratoriya, v. 28, no. 6, 1962, 726-729

TEXT: The Young modulus of various specimens was measured from the natural frequencies of their longitudinal and transverse oscillations. The error in calculating the Young modulus by various approximation formulas is demonstrated to depend on the length-to-thickness ratio of the specimen. This error is significant if the Young modulus is determined on short specimens. The error can be reduced by choosing slender objects and taking into account the rotational inertia and displacement of the specimen's elements in the bending oscillations. There are 1 figure and 1 table.

ASSOCIATION: Institut metallokeramiki i spetsial'nykh splavov Akademii nauk USSR (Institute of Powder Metallurgy and Special Alloys of the Academy of Sciences UkrSSR)

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ACCESSION NR AM1020385 BOOK EXPLOITATION S/

Kuz'menko, Vasiliy Aleksandrovich

Sonic and ultrasonic oscillations in dynamic testing of materials (Zvukovy*ye i ul'trazvukovy*ye kolebaniya pri dinamicheskikh ispy*taniyakh materialov), Kiev, Izd-vo AN SSSR, 1963, 150 p. illus., biblio. 2,600 copies printed. (At head of title: Akademiya nauk Ukrainskoy SSR. Institut metallokeramiki i spetsial'-ny*kh splavov).

TOPIC TAGS: sonic testing, ultrasonic testing, elasticity, fatigue

PURPOSE AND COVERAGE: The book gives some methods of using sonic and ultrasonic oscillations to study the characteristics of elasticity, inelasticity, and fatigue; besides a classification and description of the experimental methodologies, the design features of various testing equipment used to study the above properties of materials are examined. New data on the mechanical properties of metals and some useful information on sonic and ultrasonic techniques are also given. The book is intended for research and engineering workers in the field of dynamic testing of the strength of materials.

TABLE OF CONTENTS [abridged]:

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ACCESSION NR: AT4033999 S/0000/63/000/000/0145/0146

AUTHOR: Sukhorukov, B. I.; Kuz'menko, V. A.; Blyumenfel'd, L. A.

TITLE: Polycondensation of saccharides and formation of conjugated systems in the solid phase. I. Detection of paramagnetism in protonized saccharides

SOURCE: Geterotsepny*ye vy*sokomolekulyarny*ye soyedineniya (Heterochain macromolecular compounds); sbornik statey. Moscow, Izd-vo "Nauka," 1963, 145-146

TOPIC TAGS: polycondensation, saccharide, conjugated system, conjugated bond polymer, paramagnetism, protonized saccharide, electron paramagnetic resonance

ABSTRACT: The study is an extension of the authors' previous work in which riboside polycrystals were found to produce, at sufficiently low pH and temperatures, an electron paramagnetic resonance signal linked to the carbohydrate component of the system. The polycondensation of ribosides and saccharides carried out by the action of HCl in the solid phase, resulted in conjugated-bond polymers, not identified immediately, which produced an electron paramagnetic resonance signal in the form of a narrow symmetrical line with a free electron g-factor, a width of 6-8 oersteds between the points of the

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ACCESSION NR: AT4033999

maximum decline and an intensity of $\sim 10^{19}$ spin/g substance. The preparation of solid phase polycrystalline samples is described in detail and the supposition is made that the signal is caused by local paramagnetic centers of a radical or ion-radical nature.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics, AN SSSR)

SUBMITTED: 27Sep62 DATE ACQ: 30Apr64 ENCL: 00

SUB CODE: OC NO REF SOV: 008 OTHER: 000

Card 2/2

KUZ'MENKO, V.A. [Kuz'menko, V.O.]

Relaxation theory of energy scattering in materials during cyclic deformations. Dop. AN URSR no.6:773-777'63

(MIRA 17:7)

1. Institut metallokeramiki i spetsial'nykh splavov AN UkrSSR. Predstavleno akademikom AN UkrSSR I.N. Frantsevichem [Frntsevych, I.M.].